The Caprellidae (Crustacea: Amphipoda) of the Western North Atlantic[1]

Introduction

The most important publications on the systematics of the caprellids are the three monographic treatments by Paul Mayer (1882, 1890, 1903). These indispensable works summarized all that was known of caprellid taxonomy at that time, including many western Atlantic species. Unfortunately, Mayer's work complicated caprellid taxonomy by recognizing in some species, such as the composite species *Caprella acutifrons,* large numbers of varieties which appear by modern concepts to be full species. In other instances he took a rather narrow view of species.

Although caprellid amphipods are abundant and familiar members of the marine benthos, western Atlantic species have received only limited and superficial study by taxonomists. Seventeen valid species have been reported from this area. Holmes (1905) briefly characterized the five species known from New England and Kunkel (1918) did the same for four Connecticut species, including one species not mentioned by Holmes. Recently, Steinberg and Dougherty (1957) reported nine species from the Gulf of Mexico, one of which was new. In my paper (1965) five species occurring in Virginia waters are reviewed. Both Pearse (1908) and Stebbing (1895) described new species from the West Indies and Huntsman (1915) described a new species from the Bay of Fundy. Including the papers mentioned above, some 50 publications deal with the western Atlantic caprellids, the majority being faunal lists of local areas.

This paper deals primarily with the systematics of the Caprellidae occurring from the tropical to boreal areas of the western North Atlantic, roughly from the Equator to Nova Scotia. The paucity of available material from the east coast of South America prevents consideration of species south of the Equator. North of Nova Scotia the caprellid fauna changes abruptly and it is, therefore, desirable to defer treatment of the caprellids from this area until the Arctic caprellid fauna can be considered in its entirety. In all, 28 species of caprellids are treated in this paper with 2 new genera, 4 new species, and 1 new rank described.

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[1] Modified from a dissertation submitted to The George Washington University in partial satisfaction of the requirements for the degree of Doctor of Philosophy.

This work is based primarily on the collections of the Division of Crustacea, Smithsonian Institution. Extensive unidentified collections were obtained from the National Museum of Canada, Woods Hole Marine Biological Laboratory, University of Cape Town, Zoölogische Laboratorium in Utrecht, Duke University Marine Laboratory, and the Smithsonian Oceanographic Sorting Center. In addition, I was able to spend 4 months collecting along the Gulf of Mexico and southeastern Atlantic coasts of the United States. Through the cooperation of the U.S. Coast Guard, I was allowed to accompany the USCGC *Madrona* (buoy tender) on a cruise servicing buoys along the Virginia and North Carolina coasts. These buoys yielded large numbers of several species which aided in the study of intraspecific variation.

Taxonomic Section

Taxonomic Characters

Mayer (1882, 1890, 1903) usually used 11 characters to delineate caprellid genera. These were the number of articles in the flagellum of antenna 2, the presence or absence of swimming setae on antenna 2, the number of articles in the mandibular palp and the setal formula for the terminal article,the number of gill pairs, the number of appendage pairs of both the male and female abdomens, the number of articles in pereopods 3–5, the number of gill pairs, and the length ratio of the inner and outer lobes of the maxilliped. Occasionally he resorted to other characters such as the fusion of pereonites 6 and 7 in *Metaprotella* and *Orthoprotella.* This paper adds the position of the insertion of pereopod 5 and the presence or absence of a molar on the mandible.

Body spination varies considerably within the same species and its value as a specific character is questionable. In *Aeginina longicornis* this variation is quite pronounced and has caused a considerable proliferation of names for what appear to be only infrasubspecific variants. Harrison (1940) found that body spination did not appear on *Pseudoprotella phasma* before the 10th instar, which lends support to my opinion that body spination is a questionable specific character. It should be noted that those species which are spinose are frequently covered with large amounts of detritus. Body spination may, therefore, offer some protective advantage and could possibly be correlated with predatory pressure.

The peduncle of antenna 1 is a useful character for the delineation of some species. The presence of setules sometimes distinguishes males of *Caprella linearis* (fig. 14b) from other related species. Inflation of the peduncular articles is exhibited in several species and is quite useful for the separation of *Caprella andreae* from other members of the *Caprella acutifrons* group.

The number of articles in the flagellum of antenna 1 varies considerably, depending upon the size and sex of the individual. The greatest number of articles may be useful for characterizing some species with an unusually long flagellum. The relative lengths of the proximal and distal flagellar articles have been used to characterize some species but probably do not have generic significance. Mayer divided *Caprella scaura* into groups on the basis of the number of fused proximal articles of the flagellum; however, in most species this number is proportional to the size of the individual and is of little value.

Most caprellid genera have 2 articles in the flagellum of antenna 2; however, some genera such as *Phtisica* and *Hemiproto* have more than 2. *Phtisica* lacks a molar on the mandible. The lack of a molar and the multiarticulate flagellum on antenna 2 may be correlated with the fact that *Phtisica* is frequently found in plankton samples and therefore subject to dietary habits different from those of benthic forms.

Mayer (1903, p. 47) used the presence of swimming setae on antenna 2 to characterize *Tritella*. Later Dougherty and Steinberg (1953) described *Tritella tenuissima* which lacked swimming setae, and they expressed the opinion that the presence or absence of swimming setae was not a good generic character. Since *T. tenuissima* shares more characters with *Triliropus* (p. 57) than with the members of *Tritella*, Mayer's belief that the presence of swimming setae is a valid generic character seems justified.

The mouthparts offer, in my opinion, some of the best, although virtually neglected, taxonomic characters. The mouthparts reflect feeding habits and thereby, at least to some extent, the niche of an organism. Mayer (1903, p. 13) admitted that he neglected the mouthparts except for the proportions of the maxillipedal lobes and the mandibular palp. Regrettably, he (1890, p. 107; 1903, p. 73) believed that the mouthparts of the *Caprella* species were all quite similar and of little value in classification. Most of the mouthparts of *Caprella* species are similar; however, the lacinia mobilis of the right mandible offers a useful character for subdividing this large genus. The left lacinia mobilis is usually 5-toothed apically, while the right lacinia mobilis may be either 5-toothed, serrate, or smooth. *Phtisica* and allied genera have developed [2] several accessory plates in addition to the lacinia mobilis, and these genera usually lack a molar (fig. 47i–j). This unusual type of mandible undoubtedly reflects genetic relationships and will probably form a basis for separation of the Caprellidae into subfamilies or other higher taxa.

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[2] Assuming that the caprellids arose from a podocerid type gammaridean having a typical mandible with incisor, lacinia mobilis, setal row, and molar.

As stated above Mayer used the mandibular palp as a generic character. Those caprellids which lack a mandibular palp such as *Caprella* have considerably more setation on the mouthparts, antennae, and gnathopods 1. This increase in setation could compensate for the loss of the cleaning ability of the mandibular palp. Very little is known of the dietary habits of those forms which bear a mandibular palp and only a little more is known of those that do not. The setal formula for the palp refers to the number of long, intermediate, and short setae on the terminal article. For example, the setal formula 1-x-y-1 indicates the presence of 1 long seta at either end of a row of a variable number of short setae (x) and also a variable number of intermediate setae (y).

In addition to the mandible the maxilliped also offers some neglected characters which may be of generic significance. The distal margin of the inner lobe varies in shape from rounded to flattened and may bear a variety of tooth types, spines, and setae. As examples of the extremes of inner lobe diversity, the paired inner lobes of *Phtisica* and allied genera are as large as the outer lobes, almost completely fused, and are armed with several unusually large teeth (fig. 47h) while the inner lobes of *Paracaprella* are much smaller than the outer lobes, not fused, and bear only a few setae (fig. 43e).

The outer lobe of the maxilliped shows considerable variation in spination, serration, and setation. Such characters as the subterminal notch in *Luconacia* (fig. 35d) or the large serrations on the medial margin in *Mayerella* (fig. 37e) may have generic importance. However, in too few of the caprellid species have maxillipeds been adequately illustrated and described to permit evaluation.

The palp of the maxilliped offers several characters which may possibly be of generic significance. Schurin (1935) used the reduction of the dactylus as one of the characters to separate his new genus, *Eugastraulax*, from the genus *Caprella;* however, the value of this character is questionable. In *Paracaprella* and *Deutella* the distal end of the terminal article bears several large setae (fig. 43e). These large setae are not present in most other caprellid genera. Another character which may have generic importance is the presence of a distal projection on the penultimate article as in *Paracaprella* (fig. 43e).

The number of spines on the outer lobe of maxilla 1 varies among some genera. In *Phtisica* there are 6 spines (fig. 47f) whereas in *Caprella* there are 7 spines (fig. 8e). Again it is regrettable that this character has not been examined in enough genera to comment on its value.

Gnathopod 1 has several characters which may be of generic or at least specific value. In the western Atlantic species, the number of grasping spines on the propodus varies from 1–5 (compare figs. 38d, 8h, 47c) and seems to be fairly constant within each genus. Another character of gnathopod 1 which may prove to be important is the presence or absence of serrations on the grasping margins of the dactylus and propodus. In *Paracaprella* both margins are serrate (fig. 41h) whereas in contrast, those of *Hemiaegina* are completely smooth (fig. 30b).

The shape and ornamentation of gnathopod 2 has long been used as a specific character in the Amphipoda, and it is needless to comment on it here except that one must take into consideration the degree of variability this appendage shows at different growth stages. Mayer used the term "poison tooth" to refer to the large tooth on the palm of the propodus. There is evidence that glandular material is present near this tooth, and it appears to be venomous in nature (Wetzel, 1932, p. 387). I have used the term grasping spine when the major "tooth" of the propodus is a spine and have restricted the use of poison tooth to an eminence which is not delimited at its base or which has previously been designated a poison tooth. Usually grasping spines occur in pairs and when closed the tip of the dactylus fits between them. These spines are found on the gnathopods and the pereopods.

The number of gill pairs was used by Mayer as a generic character. Undoubtedly this is an important character but perhaps too much value is placed on it since the gills show various stages of reduction. Some genera with 3 pairs of gills show a closer relation to genera with 2 pairs than to other genera with 3 pairs, as for example *Dodecas* and *Dodecasella*.

The pereopods on pereonites 3–5 are reduced in many caprellid genera. Although the number of articles of these rudimentary appendages is presently important for generic identification, it is often difficult to count the articles, particularly when the terminal article is small or shows some degree of fusion with the penultimate article. Since these appendages are rudimentary and show all degrees of reduction, their value as a generic character is questionable. In *Mayerella redunca* (p. 75) a female has 2 articles in pereopod 5 instead of the usual 3 and there can be no question that this specimen belongs to this species. The use of these pereopods as a generic character seems to mask the phylogenetic relationships of the genera, and it is my belief that the mouthparts provide a better concept of relationships. It should be noted that I follow the system of naming the pereopods according to the pereonites upon which they occur; i.e., pereopod 3 occurs on pereonite 3. This practice has not been consistently followed in the past; various authors (Barnard, Briggs, Guiler, and Huntsman) preferred to number these appendages beginning with pereonite 3.

The abdomen presents one of the most difficult characters to use for identification. It is extremely small and hard to illustrate accurately. Unfortunately, it has been one of the most important characters and the correct generic determination usually depends upon elucidating its structure. Mayer stressed the importance of the abdomen by separating closely related genera such as *Deutella* and *Luconacia* primarily by differences in the abdomen. Mayer's emphasis on this character is justified; however, due to its vestigial nature it suffers from the same criticism as pereopods 3–5. In dealing with the many stages of reduction of the appendages on the abdomen, Mayer was inconsistent in what he considered to be a "Klappe" or vanished appendage. This is especially true in those genera which do not bear true appendages but which have several setae or even a single seta borne on a type of flap or lobe. For an example of this, compare Mayer's (1903) figures of the abdomen of the *Triliropus* male (pl. 9 fig. 70), which he says bears one-half pair of appendages, with that of the *Pseudoproto* male (pl. 9 fig. 52) which he claims to be without appendages. Both abdomens have lobes with several setae; therefore, due to this inconsistency I have refrained from using Mayer's terminology of one-half appendage pairs but have instead given the number of recognizable appendages and have described the lobes.

Illustrations and Measurements

Illustrations of the whole mounts were made by the use of a microprojector and those of dissected appendages with a camera lucida. Pencil sketches were first made which were later copied on Ethulon tracing film. All scales on the figures equal 1 mm for the whole mount.

Measurements of the total length refer to the length of a line drawn from the anterior portion of the cephalon between the insertions of antennae 1 and 2, through the midlateral portion of each pereonite, to the posterior tip of the abdomen.

Key to the Caprellidae of the Western North Atlantic

(See figure 1 for explanation of characters.)

1.	Mandible with palp or setae representing vestige of palp	2
	Mandible without palp	17
2.(1)	Pereopods 3 and 4 absent	3
	Pereopods 3 and 4 present	6
3.(2)	Abdomen with only pair of lobes	**Pseudaeginella antiguae** (p. 100)
	Abdomen with appendages	4
4.(3)	Abdomen with pair of appendages and pair of lobes.	**Aeginella spinosa** (p. 8)
	Abdomen with 2 pairs of appendages	5
5.(4)	Abdomen with only 2 pairs of appendages.	**Proaeginina norvegica** (p. 97)
	Abdomen with 2 pairs of appendages and pair of lobes.	**Aeginina longicornis** (p. 13)

6.(2) Pereopods 3 and 4 1-segmented 7
Pereopods 3 and 4 2- or 6-segmented 8
7.(6) Pereonites 6 and 7 fused . . . . . . **Metaprotella hummelincki** (p. 78)
Pereonites 6 and 7 not fused . . . . . **Fallotritella biscaynensis** (p. 58)
8.(6) Pereopods 3 and 4 2-segmented 9
Pereopods 3 and 4 6-segmented 15
9.(8) Pereopod 5 2- or 3-segmented 10
Pereopod 5 6-segmented 11
10.(9) Abdominal appendage of male short, equal in length to penes. **Mayerella limicola** (p. 73)
Abdominal appendage of male much longer than penes, recurved at tip. **Mayerella redunca** (p. 75)
11.(9) Pereopod 5 inserted near midlength of pereonite 5. **Luconacia incerta** (p. 68)
Pereopod 5 inserted in posterior part of pereonite 5 12
12.(11) Mandibular palp reduced; when 3-segmented, terminal article minute. 13
Mandibular palp not reduced, 3-segmented, terminal article not minute. 14
13.(12) Mandibular palp represented by single seta; males with large triangular projection on anteroventral margin of pereonite 2, basis of gnathopod 2 with proximal knob on posterior margin. **Paracaprella pusilla** (p. 82)
Mandibular palp represented by knob with seta or with several reduced articles; males with small projection on anterolateral margin of pereonite 2, basis of gnathopod 2 without proximal knob. **Paracaprella tenuis** (p. 86)
14.(12) Cephalon with dorsal spine . . . . **Deutella californica** (p. 51)
Cephalon without dorsal spine . . . . **Deutella mayeri** (p. 54)
15.(8) Abdomen of male with 2 pairs of appendages, females with 1 pair. **Hemiproto wigleyi** (p. 65)
Abdomen of male with 3 pairs of appendages, females with 2 pairs . . 16
16.(15) Carpus of gnathopod 2 longer than merus . . **Phtisica antillensis** (p. 89)
Carpus of gnathopod 2 shorter than merus . . . **Phtisica marina** (p. 91)
17.(1) Pereopods 3 and 4 1-segmented . . . . . **Hemiaegina minuta** (p. 61)
Pereopods 3 and 4 absent 18
18.(17) Pereopods 5–7 without grasping spines 19
Pereopods 5–7 with grasping spines 21
19.(18) Cephalon with anteriorly directed triangular projection. **Caprella penantis variant** (p. 35)
Cephalon without anteriorly directed projection 20
20.(19) Abdomen of male with hooked papillae at tip of appendage, female with small palplike appendage . . . . **Caprella danilevskii** (p. 22)
Abdomen of male without hooked papillae on appendage, female without palplike appendage . . . . **Caprella unica** (p. 49)
21.(18) Cephalon with large anteriorly directed dorsal spine or projection . . 22
Cephalon without dorsal spine or with nonanteriorly directed spine . . 24
22.(21) Cephalon with sharp anterodorsally directed spine, males with up to 9 fused articles in flagellum of antenna 1 . . . **Caprella scaura** (p. 40)
Cephalon with anteriorly directed triangular projection, males with less than 4 fused articles in flagellum of antenna 23
23.(22) Palm of propodus of pereopods 5–7 convex . . **Caprella andreae** (p. 19)
Palm of propodus of pereopods 5–7 concave . **Caprella penantis** (p. 33)

24.(21) Ventral spine present between insertions of gnathopods 2.
Caprella equilibra (p. 25)
Ventral spine not present between insertions of gnathopods 2 25
25.(24) Propodus of gnathopod 2 with small spine on inner surface near poison tooth 26
Propodus of gnathopod 2 without small spine on inner surface near poison tooth . . . . **Caprella equilibra** variant (p. 29)
26.(25) Ratio of total length to length of basis of gnathopod 2 greater than 13.0; dorsal surface of pereonites 1–4 usually spinose, cephalon with at least 1 large spine . . . . **Caprella septentrionalis** (p. 44)
Ratio of total length to length of basis of gnathopod 2 smaller than 13.0; dorsal surface of pereonites 1–4 usually smooth, cephalon infrequently with small spine . . . . **Caprella linearis** (p. 30)

Aeginella Boeck, 1861

Flagellum of antenna 2 biarticulate, swimming setae absent; mandibular palp 3-segmented, setal formula for terminal article 1-x-1, molar present; outer lobe of maxilliped larger than inner lobe; gills on pereonites 3 and 4; pereopods 3 and 4 absent, pereopod 5, 6-segmented; abdomen of male and female with pair of appendages and pair of lobes.

Type-species: *Aeginella spinosa* Boeck, 1861 (by monotypy).

Remarks.—The genus *Aeginella* is very closely related to *Aeginina* and *Proaeginina*, differing from them only by the structure of the abdomen. There is a gradation from 1 pair of appendages with lobes, 2 pairs of appendages, to 2 pairs of appendages with lobes in the series *Aeginella–Proaeginina–Aeginina*.

Aeginella spinosa Boeck, 1861

Figures 2, 3, 54

Aeginella spinosa Boeck, 1861, pp. 673–674; 1871a, pp. 272 (192)–273 (193); 1873–76, pp. 684–686, pl. 32, fig. 4.—M. Sars, 1863, pp. 290–291.—Mayer, 1882, p. 36; 1890, pp. 36–37, pl. 1, fig. 24, pl. 5, figs. 30–33; 1903, p. 61.—G. Sars, 1886, pp. 70, 89; 1895, pp. 653–654, pl. 235, fig. 1.—Norman, 1886, p. 26; 1905a, p. 26.—Hansen, 1887b, pp. 172–173; 1895, p. 130.—Vanhöffen, 1897, p. 213.—Nordgaard, 1905, p. 185.—Stephensen, 1913a, pp. 222–223; 1916, p. 295; 1929a, p. 178, fig. 332; 1929b, pp. 19, 34; 1933, pp. 60, 77; 1935, p. 118; 1940, p. 69; 1942, pp. 429–430, 502, 503; 1944a, pp. 48–49, map 9; 1944b, pp. 135–136, 148, 159, 162.—Derjugin, 1915, pp. 453, 456.—Schneider, 1924 (1926), p. 59.—McCain, 1966, p. 92.

Diagnosis.—Since this genus is monotypic, the characters of the genus are diagnostic for the species.

Description.—Body rather robust, spinose; cephalon with anterior projection, separated from pereonite 1 by distinct suture. Pereonite 1 with dorsal anterior spine. Dorsal surface of pereonite 2 with pair of spines at midlength of pereonite and single posterior spine, insertion of gnathopod 2 with small spine, anterolateral margin produced

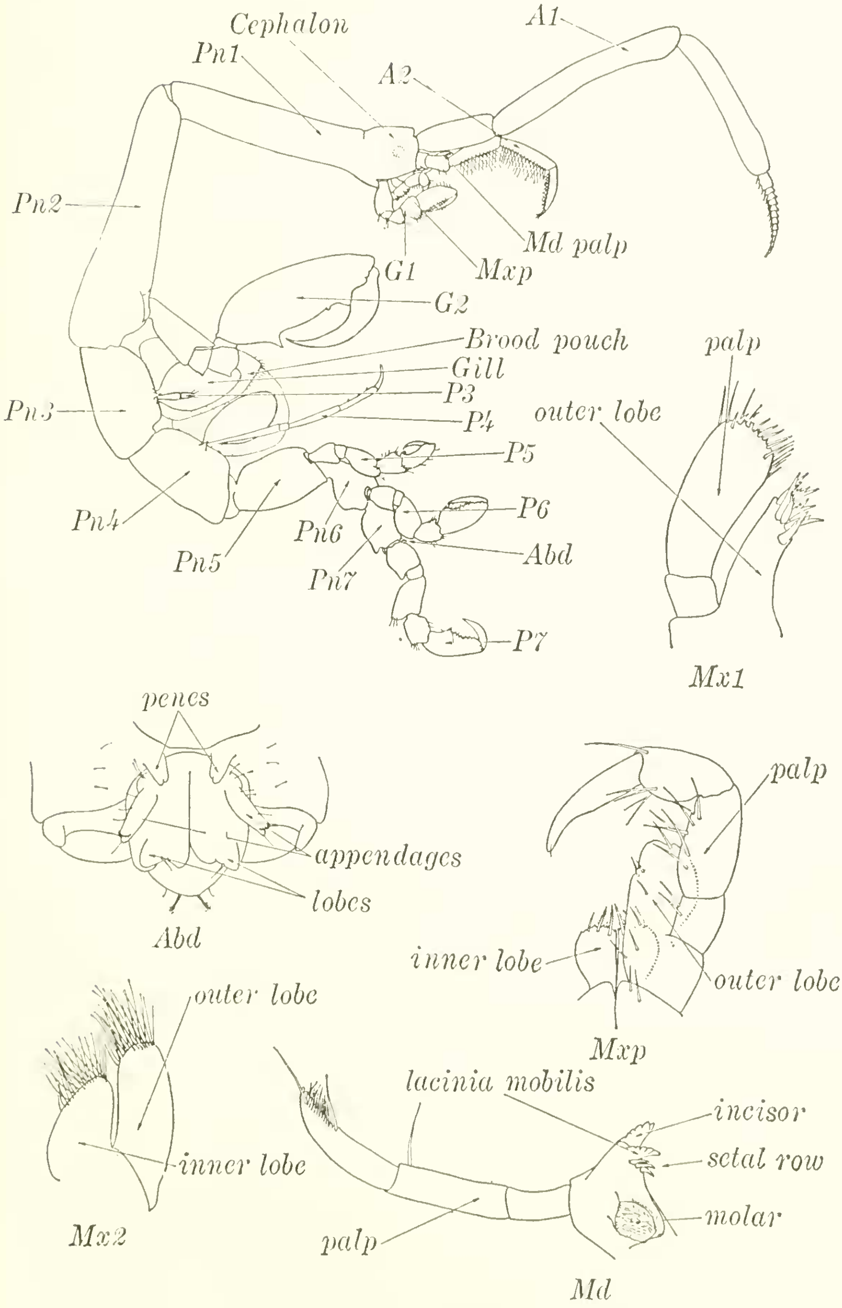

FIGURE 1.—Generalized caprellid: *A* (antenna), *Abd* (abdomen), *G* (gnathopod), *Md* (mandible), *Mx* (maxilla), *Mxp* (maxilliped), *P* (pereopod), *Pn* (pereonite).

into triangular projection. Dorsal surface of pereonite 3 with pair of anterior spines, sometimes reduced to small humps, pair of mid-posterior spines, and single posterior spine; anterolateral margin produced as in pereonite 2; lateral margin of pleura with anterior and posterior spines and spine above gills in males, females without posterior spine. Pereonite 4 similar to pereonite 3 in males, females without dorsal anterior spine. Dorsal surface of pereonite 5 similar to pereonite 3, pleura with only anterior spine and dorsally directed spine at base of pereopod 5. Pereonite 7 with dorsally directed spine at base of pereopod 7. Length of largest male 20 mm, female 16 mm.

Setal formula for terminal article of mandibular palp 1–10–1 to 1–12–1. Left mandible with 5-toothed incisor, 5-toothed lacinia mobilis, setal row of 3 serrate setae, molar with plumose seta. Right mandible with 5-toothed incisor, lacinia mobilis serrate on cutting margin, setal row of 2 serrate setae, molar with plumose seta. Palp of maxilla 1 usually with 5 robust apical spines and several setae; outer lobe with 7 apical spines, usually bifid but sometimes more branches with increase in size of individual. Inner and outer lobes of maxilla 2 quite setose on apical margin and spines occasionally present. Outer lobe of maxilliped with 2 apical setae, 1 long apical spine, and up to 12 smaller marginal spines; inner lobe with 2 small spines and up to 12 apical setae, as many as 9 of which plumose; palp similar to that of *Caprella*.

Propodus of gnathopod 1 triangular with 2 proximal grasping spines, grasping margin not distinctly serrate; grasping margin of dactylus serrate, particularly at tip. Propodus of gnathopod 2 quite robust, palm heavily setose with small proximal tooth, anterior margin with distal projection; dactylus not serrate.

Gills subelliptical.

Pereopods 3 and 4 absent. Pereopods 5–7, 6-segmented, palm of propodus with pair of proximal grasping spines.

Abdomen of male and female with 1 pair of appendages and pair of setose lobes; in male appendage placed on raised projection and uniarticulate; in female, appendage neither on projection nor articulated.

Variation.—This species appears to be quite constant in body spination with the exception of the first pair of spines on the dorsal surface of pereonite 4. These may be present as fully developed spines or as only small humps.

Distribution.—Type-locality: Haugesund, Norway.

Other records: Murman coast to Haugesund on the Norwegian coast, Spitsbergen, Faeroe Islands, Iceland, east and west coasts of Greenland.

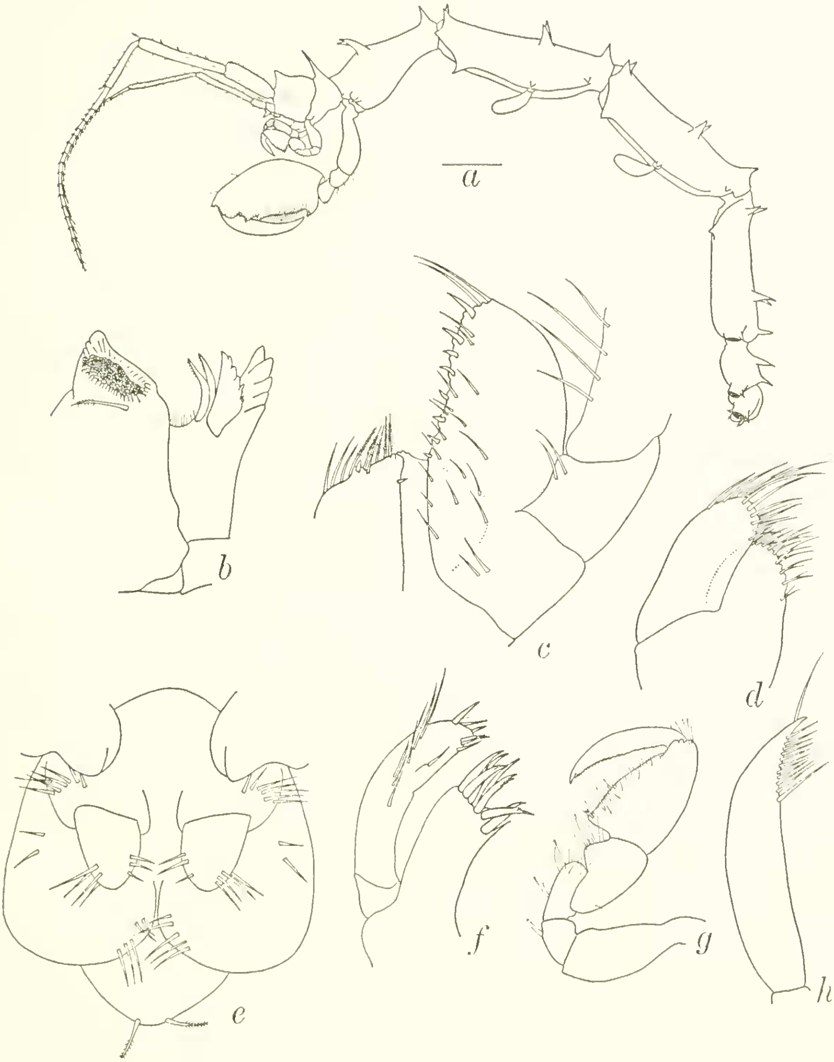

FIGURE 2.—*Aeginella spinosa*, male; *a*, lateral view; *b*, right mandible; *c*, inner and outer lobes of maxilliped; *d*, maxilla 2; *e*, abdomen; *f*, maxilla 1; *g*, gnathopod 1; *h*, terminal article of mandibular palp.

New records: Off Nova Scotia, 44°01′ N., 59°02.5′ W., 43°03′ N., 65°30′ W., and on the Banquereau Banks; off Cape Cod, 42°25′ N., 66°05′ W.

REMARKS.—This species is an Arctic one usually found in deeper water, to 1026 m. Its distribution is comparable to that of *Proaeginina norvegica* and *Aeginina longicornis*, the latter ranging far-

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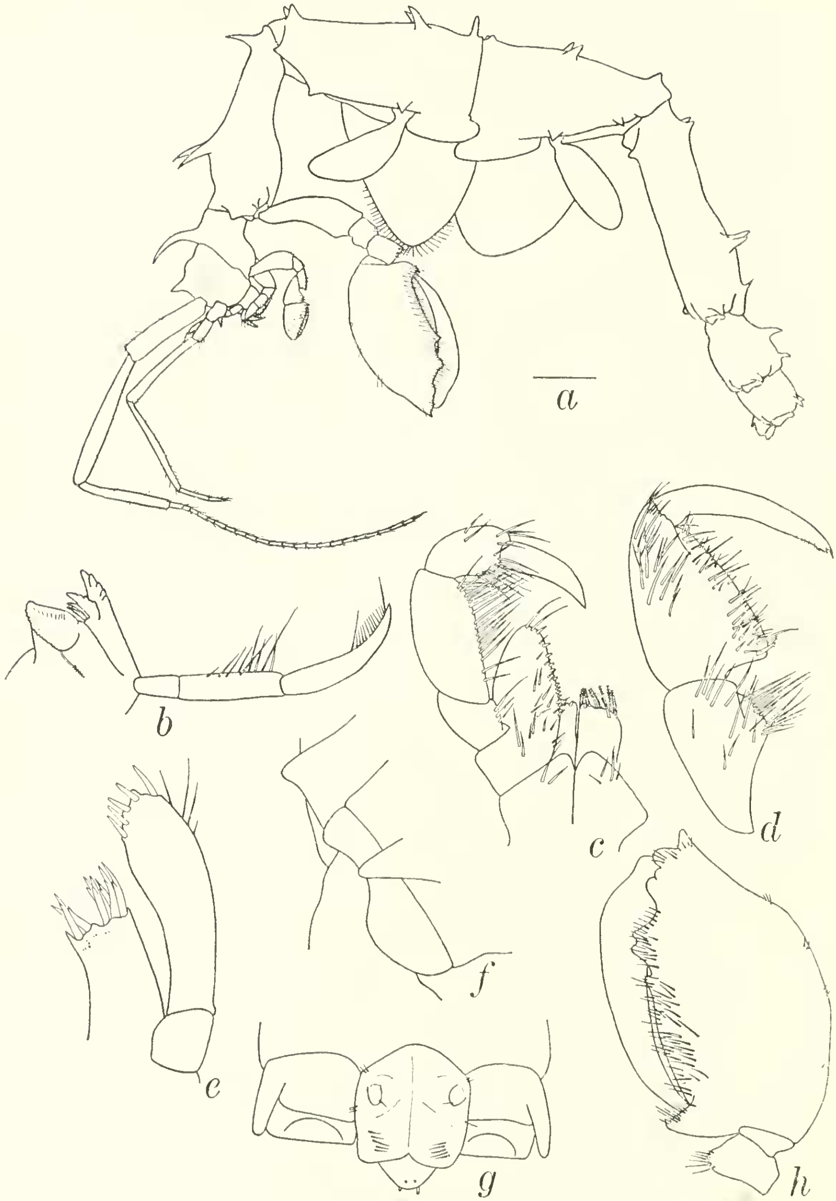

FIGURE 3.—*Aeginella spinosa*, female; *a*, lateral view; *b*, right mandible; *c*, maxilliped; *d*, gnathopod 1; *e*, maxilla 1; *f*, coxal plate of gnathopod 2; *g*, abdomen; *h*, gnathopod 2.

ther south along the western Atlantic coast and usually being found in shallower water.

Mayer (1903, p. 61) reported *Aeginella spinosa* from the asteroid, *Brisinga*, and this species has also been collected from red and brown algae and hydroids.

Aeginina Norman, 1905

Flagellum of antenna 2 biarticulate, swimming setae absent; mandible with 3-segmented palp, setal formula for terminal article 1–x–1 or 1–x–1–x, molar present; outer lobe of maxilliped larger than inner lobe; gills on pereonites 3 and 4; pereopods 3 and 4 absent, pereopod 5, 6-segmented; abdomen of male and female with 2 pairs of biarticulate appendages and 1 pair of lobes.

Type-species: *Aegina longicornis* Krøyer, 1842–43 (by monotypy).

Aeginina longicornis (Krøyer, 1842–43)

FIGURES 4–7, 54

Aegina longicornis Krøyer, 1842–43, pp. 509–515, pl. 7, figs. 1–12; 1846, pl. 24, fig. 3.—Boeck, 1871a, p. 270 (190); 1873–76, pp. 677–679.—Lütken, 1875, p. 159.—Mayer, 1882, pp. 83–84, fig. 11, pl. 5, figs. 6–10; 1890, pp. 32–35, pl. 5, figs. 27–29, pl. 6, figs. 9, 28; 1903, pp. 60–61.—Hansen,1887b, p. 171.—Norman, 1886, p. 26; 1905a, p. 26.—Stuxberg, 1882, p. 764.—Vanhöffen, 1897, p. 213.—d'A. Thompson, 1901, p. 41.—M. Rathbun, 1905, pp. 7, 76.—Brüggen, 1907, pp. 237–238.—Stephensen, 1913a, pp. 220–222; 1929b, p. 34.—Bousfield, 1958, p. 315.

Aegina spinosissima Stimpson 1854 (1853), pp. 44–45.—Miers, 1877a, pp. 104–105.—Norman, 1882, pp. 671, 684; 1886, p. 26; 1905a, p. 26.—Koelbel, 1886, p. 42.—Hansen, 1887a, p. 233; 1887b, p. 172.—Ohlin, 1895a, pp. xvii, xix, 60–62.—Vanhöffen, 1897, p. 213.—Whiteaves, 1901, p. 220.—M. Grieg, 1907, p. 551.—Calman, 1927, p. 42 (fig. 27).

Caprella spinifera Bell, 1855, pp. 407–408, pl. 35, fig. 2.—Goës, 1866, p. 535.

Aegina (*Caprella*) *echinata* Boeck, 1861, pp. 670–672.

Aegina laevis Boeck, 1861, pp. 672–673; 1871a, p. 272 (192); 1873–76, pp. 682–684, pl. 32, fig. 9.

Caprella spinosissima Bate, 1862, pp. 361–362, pl. 57, fig. 3.

Aegina echinata.—Boeck, 1871a, pp. 271 (191)–272 (192); 1873–76, pp. 680–682, pl. 32, fig. 6.—Lütken, 1875, p. 159.—Mayer, 1882, pp. 34–35.—Stuxberg, 1882, pp. 764, 780; 1887, p. 73.—G. Sars, 1895, pp. 651–652, pl. 234, fig. 2.—Stephensen, 1927a, pp. 147–148; 1928, p. 389, fig. 93 (5–7); 1929a, p. 178, fig. 331.—Gurjanova, 1929a, pp. 40–41, 46.

Aegina spinifera.—Buchholz, 1874, pp. 270, 388.—G. Sars, 1885, pp. 228–230, pl. 18, fig. 5; 1886, pp. 70, 89.—Ives, 1892, p. 481.—Klinckowström, 1892, p. 91.

Aegina Echinata.—Meinert, 1877–78, p. 168.

Aegina longicornis f. *nodosa* Mayer, 1890, p. 33, pl. 5, fig. 29.

Aegina longicornis f. *typica* Mayer, 1890, p. 33.

Aegina longicornis f. *spinifera* Mayer, 1890, pp. 33–34.—Gurjanova, 1935, p. 78.

Aeginella spinosissima.—Mayer, 1890, p. 37; 1903, p. 61.—Ortmann, 1901, pp. 154–155.—Stephensen, 1912, pp. 543–544; 1913b, p. 68.

Aegina longicornis f. *spinigera.*—Hansen, 1895, p. 130.
Aeginella longicornis.—Holmes, 1904 (1905), pp. 525–526.—Paulmier, 1905, p. 169, fig. 39.—Sumner, Osburn, and Cole, 1911 (1913), pp. 132, 134, 135, 656, chart 102.—Kunkel, 1918, pp. 175–176, fig. 53.—Allee, 1922, pp. 57, 58.—Dexter, 1944, p. 356.—Ferguson and Jones, 1949, p. 442.
Aegina longicornis nodosa.—M. Rathbun, 1905, pp. 7, 76–77.
Aegina longicornis spinifera.—M. Rathbun, 1905, pp. 7, 77.
Aegina longicornis spinosissima.—M. Rathbun, 1905, pp. 7, 77.
Aegina langicornis.—Brüggen, 1909, pp. 42–43.
Aeginina longicornis.—Norman, 1905a, p. 46.—Stappers, 1911, pp. 74–76.—Shoemaker, 1930, p. 352 (134).—Procter, 1933, p. 256.—Stephensen, 1933, pp. 59–60, 77; 1940, pp. 69–70; 1942, pp. 430–431, 502, 503; 1944a, p. 49, chart X; 1944b, pp. 135, 148, 159, 162.—Gurjanova, 1936, pp. 568, 580, 588, 589; 1964, p. 313.—Elton, 1937, p. 433.—Dunbar, 1954, pp. 784, 788.—Bousfield, 1958, p. 322.—McCain, 1965, pp. 191–192, fig. 1a; 1966, p. 92.—Cerame Vivas and Gray, 1966, p. 263.

Diagnosis.—Since this genus is monotypic, the characters of the genus are diagnostic for the species.

Description.—Body spination variable, smooth to quite spiny; cephalon separated from pereonite 1 by suture. Length of largest male 54 mm, female 34 mm, smallest ovigerous female 9 mm.

Antenna 1 usually longer than body, flagellum with up to 26 articles. Antenna 2 setose and usually shorter than articles 1 and 2 of antenna 1.

Mouthparts quite similar to those of typical *Caprella* (p. 18), lacinia mobilis of right mandible not distinctly 5-toothed but with several teeth and serrations.

Propodus of gnathopod 1 with pair of grasping spines, grasping margins of dactylus and propodus only slightly serrate. Propodus of gnathopod 2 with proximal poison tooth and distal notch, tooth, and rectangular projection, anterodistal margin with triangular projection; basis and ischium with anterodistal projections; carpus with posterodistal projection.

Propodus of pereopods 5–7 with pair of proximal grasping spines.

Abdomen of male and female with 2 pairs of biarticulate appendages and pair of lobes, medial margin of appendages with numerous minute knobs.

Variation.—The degree of spination of the body is variable. The most spiny form is illustrated in figure 4j, and there are various degrees of spination; some are almost smooth. Spination seems to vary from spinose in northern waters to smooth in southern; however, spiny forms have been found infrequently in the southern part of the range of this species.

Figure 6 illustrates the relationship of pereonite length to total body length. The solid black lines represent individuals, and the dashed lines indicate the linear relationship between pereonite length

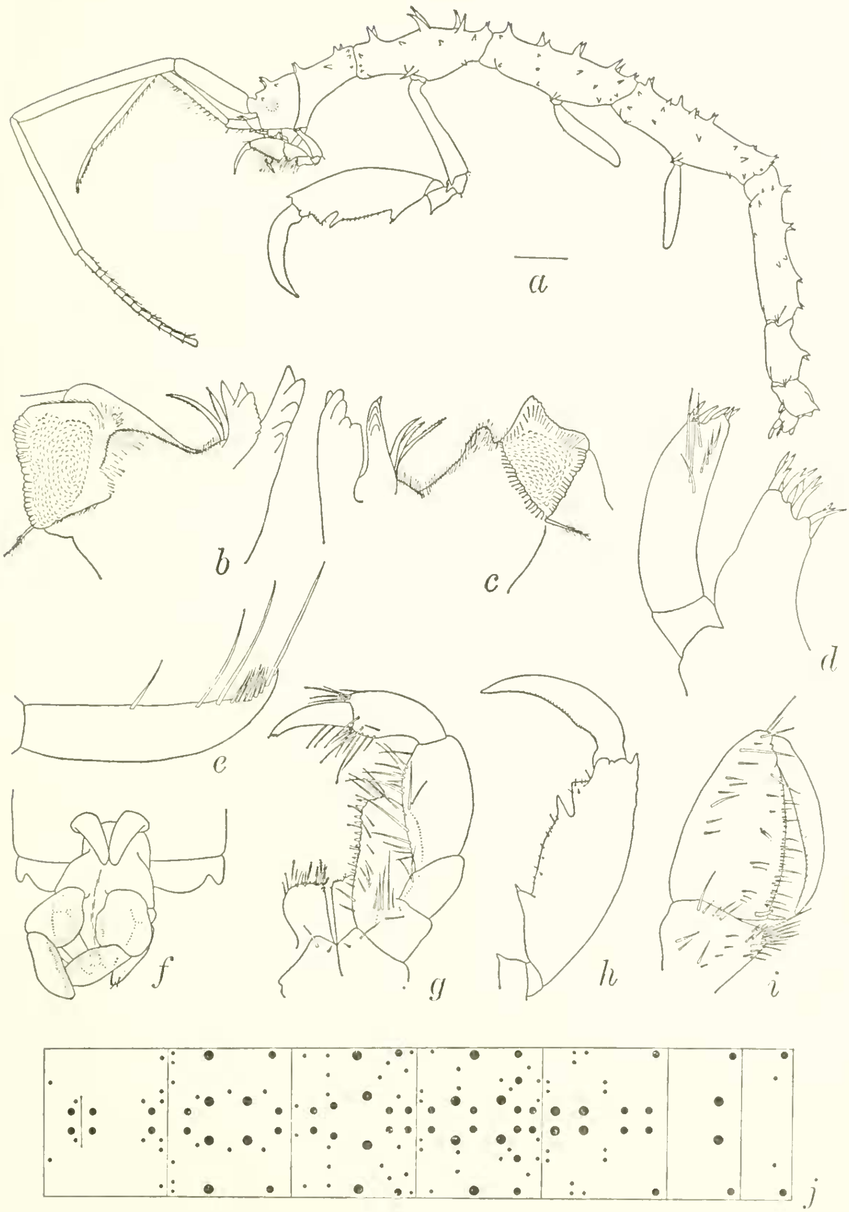

FIGURE 4.—*Aeginina longicornis*, male; *a*, lateral view; *b*, right mandible; *c*, left mandible; *d*, maxilla 1; *e*, terminal article of mandibular palp; *f*, abdomen; *g*, maxilliped; *h*, gnathopod 2; *i*, gnathopod 1; *j*, diagramatic representation of dorsal (middle) to lateral (edges) body spination, diameter of circle proportional to length of spine.

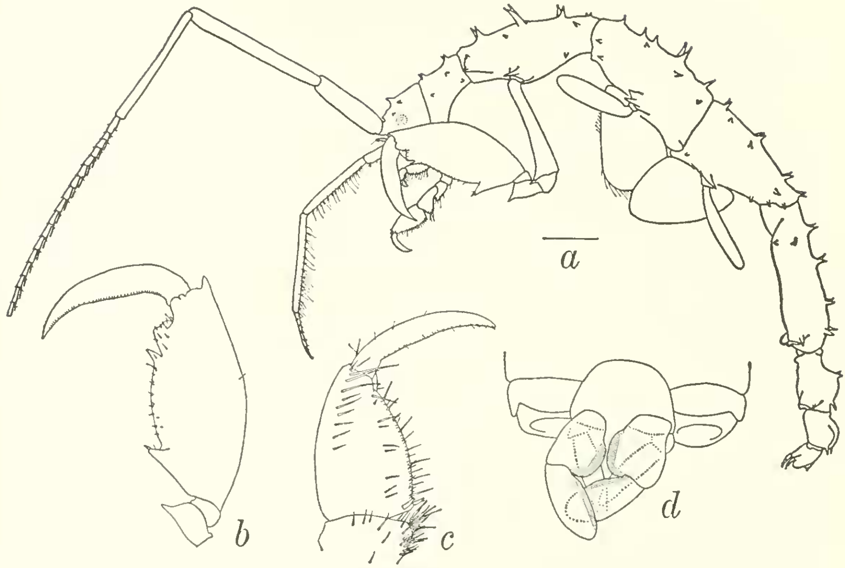

FIGURE 5.—*Aeginina longicornis*, female; *a*, lateral view; *b*, gnathopod 2; *c*, gnathopod 1; *d*, abdomen.

and total length. It is evident that pereonites 1 and 2 of both males and females increase in length at approximately the same rate. Therefore the statement made by many authors that pereonites 1 and 2 are elongated in males seems to be invalid.

DISTRIBUTION.—Type-locality: Near Frederikskäb, Greenland, at a depth of 22–29 m.

Other records: Siberian Polar Sea to 140° E.; Kara Sea; Novaya Zemlya; Franz Josef Land; Spitsbergen; Murmansk; Barents Sea; Norway; Denmark; Faeroe Islands; Shetland Islands; Jan Mayen; Iceland; eastern and western coasts of Greenland; Baffin Bay; east coast of North America from Newfoundland to Oregon Inlet, North Carolina.

New records: No records are available which extend the range of this species.

REMARKS.—This Arctic species is quite common in the northern parts of eastern North America. It is generally found in deeper water (to 2258 m) but has been collected frequently in shallow water. The habitat does not seem to be specific because it has been collected from green, red, and brown algae; sea grass; hydroids; bryozoans; and from the gut of the sea bass, *Centropristis*.

The seasonal distribution of ovigerous females is illustrated in figure 7. The largest number of samples containing ovigerous fe-

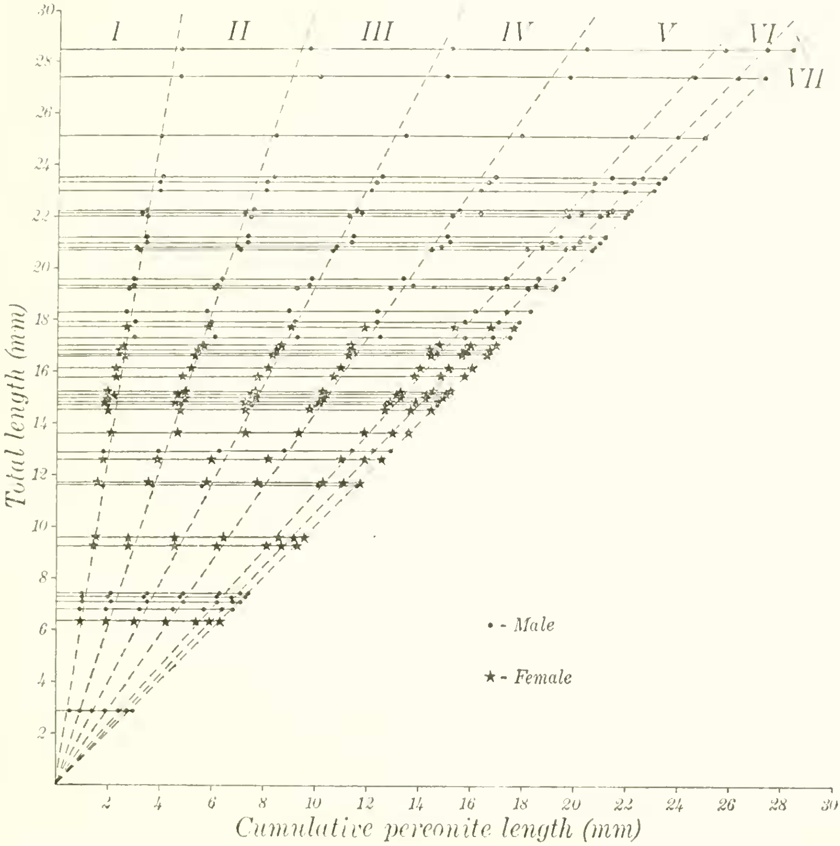

Figure 6.—*Aeginina longicornis*, cumulative pereonite length plotted against total length. Roman numerals indicate pereonites; I includes both pereonite 1 and cephalon. Solid horizontal lines represent individuals.

males was collected during August and September and the breeding season appears to extend from April to December. No ovigerous females were present in samples taken from January to March. Whether this is due to the fact that the caprellids do not breed during this period or simply that adequate samples were not taken, is not known.

The varieties of this species which are found along the east coast of North America do not appear to be geographically or bathymetrically isolated from each other and so they probably do not represent subspecies. These varieties may represent the phenotypic expression of different degrees of spination influenced by such parameters as substrate, breeding season, or diet; however, such data are not available to me.

FIGURE 7.—*Aeginina longicornis*, monthly and latitudinal distribution of ovigerous females.

Caprella Lamarck, 1801

Flagellum of antenna 2 biarticulate, swimming setae usually present; mandibular palp absent, molar present; outer lobe of maxilliped larger or equal to inner lobe; gills on pereonites 3 and 4; pereopods 3 and 4 absent, pereopod 5, 6-segmented; abdomen of male with pair of appendages and pair of lobes, female with pair of lobes.

Type-species: *Cancer linearis* Linnaeus, 1767 (subsequent designation by Dougherty and Steinberg, 1953).

REMARKS.—Mayer (1890, p. 107; 1903, p. 73) states that it is unnecessary to study in detail the mouthparts of members of this genus since the specific differences stand out much more clearly in other characters. I agree with this statement, hence, I have not included descriptions of the mouthparts other than the lacinia mobilis of the right mandible except for those appendages which exhibit variation. The typical mouthparts of *Caprella* may be characterized as follows: Mandible with 5-toothed incisor; left mandible with 5-toothed lacinia mobilis, right variable; setal row of left mandible with 3 serrate setae, right with 2 serrate setae; molar present with single small plumose seta. Outer lobe of maxilla 1 with 7 spines, palp with variable number of spines and setae. Lobes of maxilla 2 usually densely setose. Outer lobe of maxilliped with row of spines on medial margin and usually covered with numerous setae; inner lobe flattened apically with several spines and numerous simple and plumose setae; articles of palp usually heavily setose, grasping margin of dactylus finely toothed or serrate.

The abdomen also appears to vary little in *Caprella*. In the males it bears a pair of uniramous appendages at its proximal end; laterally it has a pair of lobes. The surface of the abdomen is usually covered with numerous setae, and occasionally the ventral surface between the lobes is raised to form a hump. The female abdomen is similar to that of the male except that it lacks appendages.

The propodus of ganthopod 1 is usually triangular in outline and invariably has a pair of proximal grasping spines.

Caprella andreae Mayer, 1890, new rank

FIGURES 8, 9, 55

Caprella acutifrons [not Latreille].—van Beneden, 1859, pp. 78–81, pl. 1, figs. 9–11; 1861, p. 145.—[?] Stock and Bolklander, 1952, p. 3.

Caprella acutifrons f. *Andreae* Mayer, 1890, pp. 51, 55–56, pl. 2, fig. 38, pl. 4, fig. 56, 70–71; 1903, pp. 80–81.—Chevreux and de Guerne, 1893, p. 3.—d'A. Thompson, 1901, p. 41.—Stephensen, 1915, p. 53.—Chevreux and Fage, 1925, p. 452, fig. 430a.—Ruffo, 1938, p. 150 [in part].—Utinomi, 1947, pp. 71–72.

Caprella acutifrons f. *andreae*.—Stephensen, 1929a, p. 182.

DIAGNOSIS.—Cephalon with anteriorly directed triangular projection, peduncle of antenna 1 robust in males, palm of propodus of pereopods 5–7 convex with medial grasping spines.

DESCRIPTION.—Body smooth except for anteriorly directed triangular projection on cephalon, pleura developed on pereonites 3 and 4 in larger males. Length of largest male 12 mm, female 9 mm, smallest ovigerous female 7 mm.

Peduncle of antenna 1 inflated in males, sparsely setose. Antenna 2 typical of genus.

Mouthparts typical of genus, lacinia mobilis of right mandible 5-toothed.

Gnathopod 1 typical of genus, dactylus serrate, propodus with 2 proximal grasping spines. Propodus of gnathopod 2 in males with proximal poison tooth and distal rectangular projection, palm densely setose; in females propodus with proximal poison tooth, distal projection and small middistal projection; dactylus strong and constricted medially.

Gills oval and usually quite large and inflated in males, females elliptical.

Propodus of pereopods 5–7 with 2 grasping spines at midlength, palm convex.

Abdomen typical of genus.

VARIATION.—The inflation of antenna 1 and the development of pleura increase as the size of the individual increases, large males having an unusually enlarged antenna 1 and well-developed pleura.

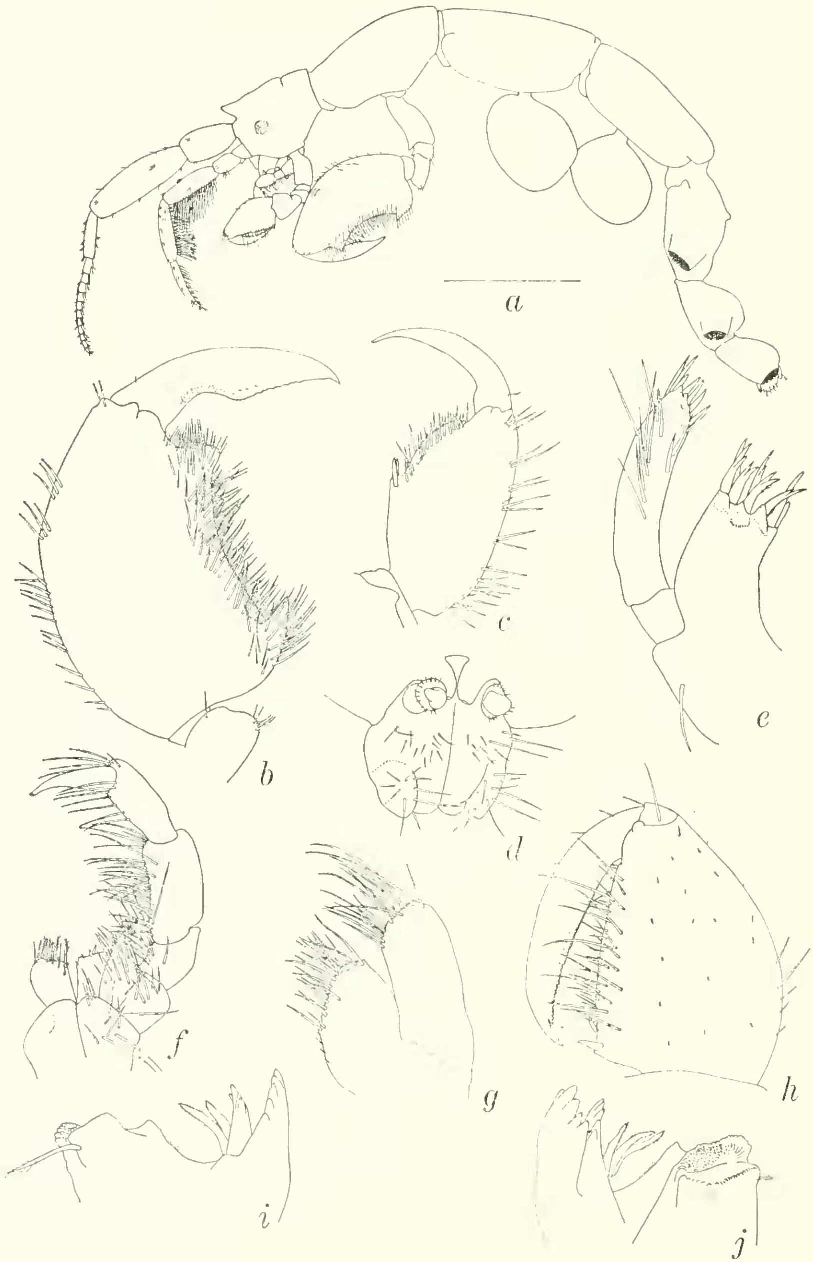

FIGURE 8.—*Caprella andreae*, male lectotype; *a*, lateral view; *b*, gnathopod 2; *c*, pereopod 6; *d*, abdomen; *e*, maxilla 1; *f*, maxilliped; *g*, maxilla 2; *h*, gnathopod 1; *i*, right mandible; *j*, left mandlble.

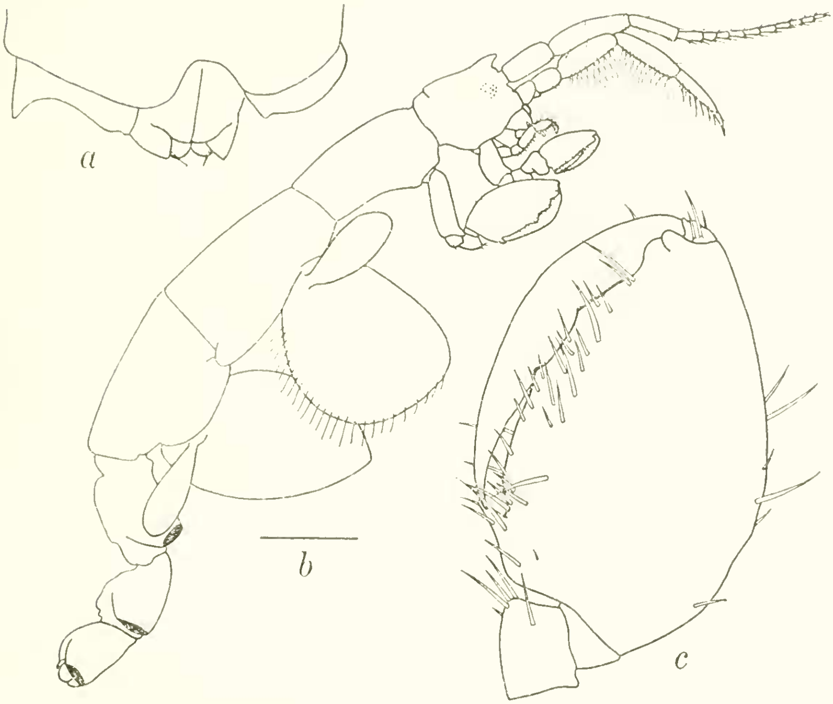

FIGURE 9.—*Caprella andreae*, female allolectotype; *a*, abdomen; *b*, lateral view; *c*, gnathopod 2.

DISTRIBUTION.—Type-locality: 38°10′ N., 64°20′ W. (see remarks). Other records: North Sea; Netherlands; Belgium; Portugal; between Portugal and the Azores; Mediterranean coast of Spain; Gulf of Lione; St. Raphael, France; Naples, Italy; Aegean Sea; 38°20′ N., 16°04′ W.; between Tokyo and Honolulu; Sea of Japan; Korean Strait; West coast of Kyushu, Japan.

New records: Algeria; off Casablanca, Morocco; off Martha's Vineyard, Mass.; Ocean City, N.J.; Cape Hatteras and Beaufort, N.C.; off Key West, Fla.; Havana, Cuba; 43°09′ N., 151°52′ W.

REMARKS.—Mayer (1890) described this species as a variety of his compound species *Caprella acutifrons* (see p. 33). This species is composed of 20 varieties or forms, many of which should be considered full species by modern criteria (see Dougherty and Steinberg, 1953). *C. andreae* differs from the other forms of this compound species by the convexity of the propodus of pereopods 5–7. It appears to be ecologically isolated from the other members of the group by its habit of usually attaching to floating objects such as driftwood, buoys, and plants. It has also been found among the incrustations on the backs of the sea turtles, *Thalassochelys* and *Chelonia*, which were collected in the Mediterranean Sea, off Havana, Key West, and Beaufort, North Carolina.

Ruffo (1938) cites this species as occurring off Brazil and Guiana; however, in personal correspondence he has advised me that he was referring to *C. acutifrons s. lato* and not specifically to *C. andreae*.

Mayer's specimens from his localities 3–7 were obtained from the Copenhagen Museum. I have selected a lectotype and an allolectotype from locality 4, 38°10′ N., 64°20′ W.

Caprella bermudia Kunkel, 1910

Caprella bermudia Kunkel, 1910, pp. 108–110, fig. 42.

Remarks.—Kunkel's description of this species is inadequate to separate it from *C. equilibra*. It has not been included under *C. equilibra* because I have not been able to examine the type material. Inquiries at most of the larger museums in Europe and North America have not revealed their location.

Caprella danilevskii Czerniavski, 1868

Figures 10, 11, 55

Caprella Danilevskii Czerniavski, 1868, pp. 92–93, pl. 6, figs. 21–34.—Mayer, 1882, p. 54; 1890, pp. 58–60, pl. 5, fig. 44, pl. 7, figs. 12–13, 54; 1903, p. 99.—Tichy, 1911, pp. 1131, 1133, 1134.—Zernov, 1913, p. 68.—Arimoto, 1930, pp. 50–51, fig. 5.—S. Carausu, 1956, pp. 131, 132.

Caprella Danilewskii.—Sovinskii, 1880, pp. 88, 100–101.—d'A. Thompson, 1901, p. 41.—Chevreux and Fage, 1925, pp. 454–455, fig. 432.—Ruffo, 1941, p. 125; 1946, p. 53.

Caprella inermis [not Grube] Haswell, 1880, p. 348, pl. 23, fig. 3; 1882, p. 314; 1884 (1885), p. 1000.—Mayer, 1882, p. 71, figs. 26–29; 1890, p. 75.—Oliveira, 1940, p. 139.—Guiler, 1954, pp. 532–533, fig. 1.

Caprella danilevskii.—Stebbing, 1888, pp. 1264–1267, pl. 145; 1910b, p. 653.—Kunkel, 1910, pp. 110–111.—Zernov, 1913, p. 233.—Barnard, 1916, pp. 280–281; 1937, pp. 134, 197.—Hale, 1929, pp. 232–233, fig. 228.—Hiro, 1937, pp. 312–313, pl. 22, fig. 6.—Utinomi, 1943a, p. 275; 1943b, p. 284, fig. 4; 1943c, p. 289; 1947, p. 73.—Edmondson and Mansfield, 1948, pp. 216–218, fig. 8.—Stschapova, Mokyovsky, and Pasternak, 1957, p. 87.

Caprella Danilevkii.—Monterosso, 1915, pp. 15–16.

Caprella danilewskii.—Carausu and Carausu, 1942, p. 82, fig. 8d.—Costa, 1960a, pp. 99, 100.

Diagnosis.—Propodus of pereopods 5–7 with numerous setae but lacking grasping spines; in males both pairs of gills elliptical, long axis usually parallel to body, in female gills on pereonite 3 usually as in males; abdomen of male with hooked papillae at tip of appendage, that of female with small palplike appendage bearing seta at medial base.

Description.—Body smooth, cephalon of large males with very small anterior projection. Length of largest male 9 mm, female 7 mm, smallest ovigerous female 4.5 mm.

Antenna 1 and 2 typical of genus.

Mouthparts typical of genus; lacinia mobilis of right mandible with 1 tooth, apical margin smooth or minutely serrate.

Propodus of gnathopod 1 with 2 proximal grasping spines, grasping margin of dactylus serrate. Propodus of gnathopod 2 in males elongate

Figure 10.—*Caprella danilevskii*, male; *a*, labium; *b*, lateral view; *c*, antenna 1; *d*, abdomen; *e*, gnathopod 2; *f*, gnathopod 1; *g*, pereopod 5; *h*, left mandible; *i*, right mandible; *j*, maxilla 2; *k*, maxilla 1; *l*, maxilliped.

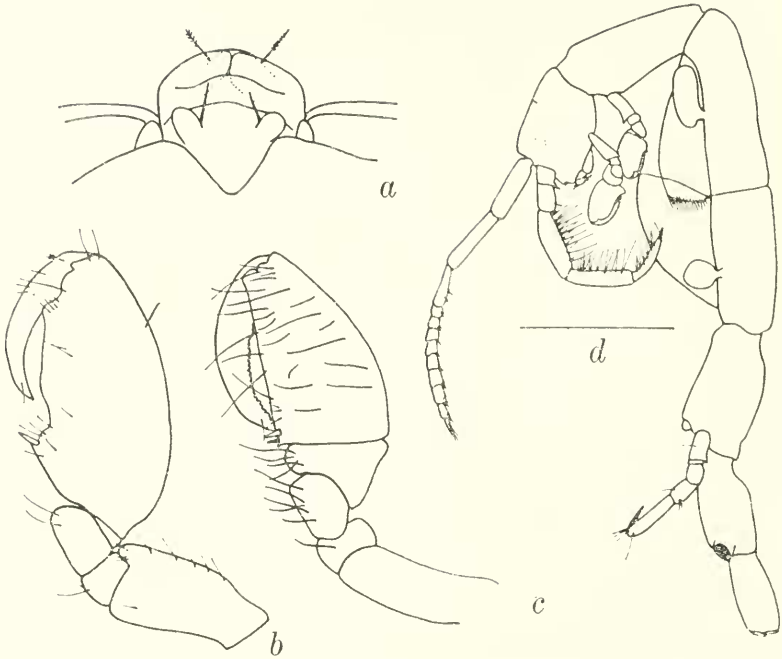

FIGURE 11.—*Caprella danilevskii*, female; *a*, abdomen; *b*, gnathopod 2; *c*, gnathopod 1; *d*, lateral view.

with posion tooth at midlength, rectangular tooth distally; dactylus less than one-half length of propodus; in females propodus with proximal poison tooth and distal rectangular tooth; dactylus more than one-half length of propodus.

Gills 3 and 4 in males and 3 in females elliptical, long axis usually parallel to body; gill 4 in females oval or elliptical.

Propodus of pereopods 5–7 without distinct grasping spines, palmar margin usually with numerous stout setae; grasping margin of dactylus serrate.

Abdomen of male typical of genus except for hooked papillae at tip of appendage, female with small palplike appendage.

VARIATION.—The shape of the gills is variable. In males the long axis is usually parallel to the body; however, either or both may occasionally be at various angles to the body. In the females either or both of the gills may have the long axis parallel to the body or may be at any angle. In small males the poison tooth on the propodus of gnathopod 2 may be more proximal than midlength; however, the dactylus remains quite short. The palm of the propodus of pereopods 5–7 varies in setation from numerous stout setae to very few.

DISTRIBUTION.—Type-locality: Black Sea.

Other records: Bay of Biscay; Mediterranean coast of France; Mediterranean and Adriatic coasts of Italy; Sicily; Ukranian and Roumanian Black Sea; Cherchell, Algeria; Rufisque, Senegal; South Africa; South Arabian coast; Bermuda; Rio de Janeiro, Brazil; Oahu, Hawaii; S. Sakhaline; Pacific coast of Hokkaido and Honshu, Japan; Amakusa Tomioka and Okinojima, Kyushu, Japan; Sea of Japan; Korean Straits; Southeastern Australia; Coles Bay, Tasmania.

New records: Virginia Key, Key Biscayne, and Matheson Hammock, Fla.; Loggerhead Key, Tortugas; St. Croix, Virgin Islands; Trinidad.

REMARKS.—This species is quite widespread and pantropical in its distribution. It has been collected on sea grass, the phaeophytes *Cystoseira* and *Sargassum*, and the bryozoan *Bugula*.

C. danilevskii is easily distinguished from the other species of *Caprella* in the western North Atlantic by its unusual gill shape, its distinctive abdomen, and the short dactylus of the male gnathopod 2.

Caprella equilibra Say, 1818

FIGURES 12, 13, 55

Caprella equilibra Say, 1818, pp. 391–392.—de Kay, 1844, p. 41.—White, 1847, p. 92.—Gibbes, 1848, p. xvi; 1849, p. 23.—Stebbing, 1888, pp. 1254–1256; 1910a, p. 466; 1910b. p. 653.—Kunkel, 1910, pp. 106–108, fig. 4.—Barnard, 1916, p. 281; 1930, p. 440; 1932, p. 300.—Schellenberg, 1928, p. 678.—Procter, 1933, p. 256.—Edmonson and Mansfield, 1948, pp. 214–216, fig. 7.—Ricketts and Calvin, 1952, p. 68.—Dougherty and Steinberg, 1953, pp. 44, 47; 1954, pp. 170, 171.—Day and Morgan, 1956, p. 303.—Steinberg and Dougherty, 1957, pp. 273–274, figs. 1–2.—Johnson, 1965, appendix 2, p. 2, appendix 3, p. 4; 1966, appendix 2, p. 2.—McCain, 1965, pp. 193–194, fig. 1b, f; 1966, p. 92.—Johnson and Juskevice, 1965, p. 39.

Caprella Januarii Krøyer, 1842–43, pp. 499–504, pl. 6, figs. 14–20.—Dana, 1853, pp. 819–820; 1855, pl. 55, fig. 2.—Herklots, 1861, p. 43.

Caprella Esmarkii Boeck, 1861, pp. 674–675; 1871a, p. 275 (195); 1873–76, pp. 693–694, pl. 32, fig. 5.

Caprella laticornis Boeck, 1861, pp. 675–676; 1871a, p. 274 (194); 1873–76, pp. 689–691, pl. 32, fig. 10.

Caprella aequilibra.—Bate, 1862, pp. 362–363, pl. 57, fig. 5; 1887, pl. 175.—Bate and Westwood, 1868, pp. 71–73.—Parfitt, 1873, p. 251.—Gamroth, 1878, pp. 101–126, pls. 8–10.—Haller, 1879a, p. 232; 1879b, p. 404.—Mayer, 1882, pp. 45–48, pl. 1, fig. 7, pl. 2, figs. 1–11, pl. 4, figs. 20–25, pl. 5, figs. 16–18; 1890, pp. 48–50, pl. 2, figs. 42–43, pl. 4, figs. 35–37, pl. 6, figs. 18a, 37; 1903, pp. 89–92, pl. 3, figs. 29–34, pl. 7, figs. 66–69; 1912, pp. 4, 5.—Marion, 1883, p. 49.—Miers, 1884, p. 320.—Carus, 1885, p. 388.—Haswell, 1884 (1885), pp. 999–1000.—de Guerne, 1886, p. xliii.—Norman, 1886, p. 26; 1905a, p. 26; 1905b, p. 85.—Thomson and Chilton, 1885 (1886), p. 142.—Chevreux, 1887a, p. 335; 1898, p. 483; 1900, p. 120.—Barrois, 1888, pp. 58, 77.—G. Sars, 1895, pp. 663–664, pl. 238, fig. 3.—d'A. Thompson, 1901, p. 41.—Graeffe, 1902, p. 19.—Hutton, 1904, p. 261.—Marine Biol. Assoc., 1904, p. 242; 1931, p. 198; 1957, p. 233.—Norman and Scott, 1906, pp. ix, 99.—Scott, 1906, p. 175.—Sinel, 1906 (1907), p. 222.—Tichy, 1911, p. 1134.—Thomson, 1913, p. 245.—LaFollette, 1914, pp. 224–225, pl. 5.—Briggs, 1914 (1915), pp. 79–80.—Kunkel, 1918, pp. 180–181.—Thomson and Anderton, 1921, p. 113.—Galdiano, 1924, p. 392.—Chevreux and Fage, 1925, pp. 455–456, fig. 433.—Schellenberg, 1926, p. 470.—Johnson and Snook, 1927, pp. 280–281, fig. 235.—Stephensen, 1927a, p. 150; 1927c, p. 355; 1928, p. 386, fig. 92 (13); 1929a, pp. 180–181, figs. 43–336; 1929b, p. 34; 1942, pp. 439, 502, 503.—Fischetti, 1932, pp. 1–28, figs. 1–5.—Oldevig, 1933, p. 269, fig. 3.—MacGinitie, 1935, p. 701.—Pirlot, 1939, p. 78.—Fiorencis, 1940, pp. 13–14, figs. 3–4, pl. 1, figs. 3, 4, 7.—Milne, 1940, p. 72.—Oliveira, 1940, p. 139.—Bertrand, 1941, pp. 12, 13, 14, 15, 16.—McDougall, 1943, pp. 363, 370.—Hewatt, 1946, pp. 196, 199, 201, 204.—Ruffo, 1946, p. 53.—Utinomi, 1947, p. 72.—Ellis, 1950, p. 13.—Reid, 1951, pp. 283, 289.—Guiler, 1952, p. 31; 1954, p. 532.—Tuzet and Sanchez, 1952, pp. 26–36, fig. 1–1&2, fig. 2, fig. 3.—Duke Univ. Mar. Lab., 1953, p. 22.—Belleudy, 1958, pp. 355–356.—Costa, 1960a, pp. 99, 100.—Luther and Fiedler, 1961, p. 158, pl. 24.—Peyrot and Trilles, 1964, pp. 1–28, figs. 1–19.

Caprella ultima Bate, 1862, pp. 364–365, pl. 57, fig. 9.

Caprella monacantha Heller, 1866, pp. 54–55, pl. 4, figs. 17–19.—Stalio, 1877, pp. 1125–1126.—Stossich, 1881, p. 230.

Caprella obtusa Heller, 1886, p. 54, pl. 4, fig. 16.—Stalio, 1877, p. 1390.—Stossich, 1881, p. 230.

Caprella megacephala A. Edwards, 1868, pp. 89–91, pl. 20, fig. 12.

Caprella aeguilibra.—Bate, 1878, p. 510.

Caprella caudata Thomson 1878 (1879), p. 246, pl. 10, fig. D–5.—Mayer, 1882, pp. 71–72; 1890, p. 76.

Caprella obesa [not van Beneden] Haswell, 1880, pp. 348–349, pl. 24, fig. 1; 1882, p. 314.

Caprella AEquilibra.—Chevreux, 1888, p. 351.

Caprella linearis [not Linnaeus].—Barrois, 1888, pp. 56–57, 77.—Chevreux, 1899, p. 484 [in part].—Chevreux and Fage, 1925, pp. 456–457, fig. 434 [in part].—Pearse, 1936, p. 193.—Wells, 1961, p. 247.

Caprella mendax Mayer, 1903, p. 114, pl. 5, figs. 9–11, pl. 8, fig. 22.

Diagnosis.—Basis of gnathopod 2 less than one-half length of pereonite 2, propodus without small proximal accessory tooth; pereonite 2 usually with spine between insertions of gnathopods 2; pereonites 1–2 elongated in large males.

Description.—Body smooth except for spine between insertions of gnathopod 2, caphalon flattened anteriorly. Length of largest male 22 mm, largest female 12 mm, smallest ovigerous female 6.4 mm.

Large males with articles 2–3 of peduncle of antenna 1 slightly shorter than antenna 2, article 3 subequal in length to article 2, article 1 less than one-half length of article 2, articles of peduncle expanded. In females and small males peduncle of antenna 1 sometimes shorter than antenna 2.

Mouthparts typical of genus, lacinia mobilis of right mandible 5-toothed.

Propodus of gnathopod 1 with 2 proximal grasping spines, grasping margin of dactylus and propodus serrate. Basis of gnathopod 2 short and stout, anterodistal margin produced into triangular projection; ischium and merus with posterodistal margin pointed in larger males; palm of propodus with munerous setae, single proximal grasping spine, distally with large rectangular tooth and slightly proximal tooth.

Gills ovate to elliptical, more ovate in larger males.

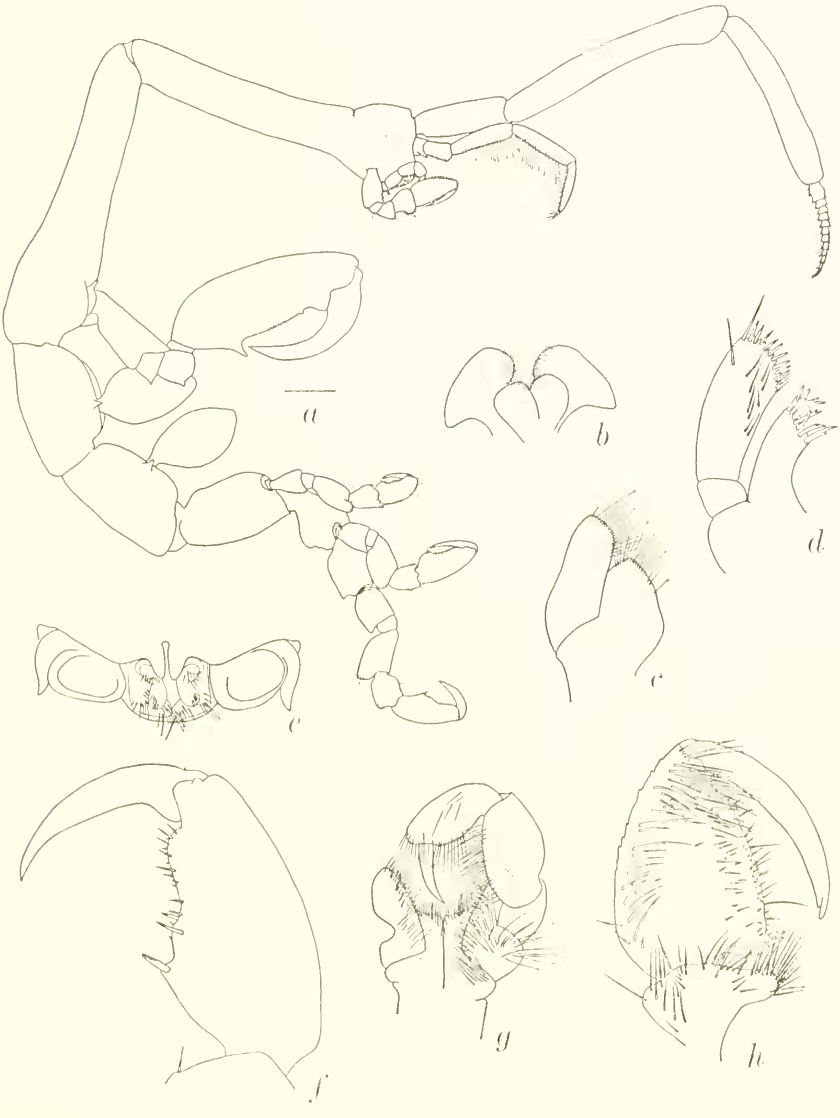

FIGURE 12.—*Caprella equilibra*, male; *a*, lateral view; *b*, labium; *c*, maxilla 2; *d*, maxilla 1; *e*, abdomen; *f*, pereopod 5; *g*, maxilliped; *h*, gnathopod 1.

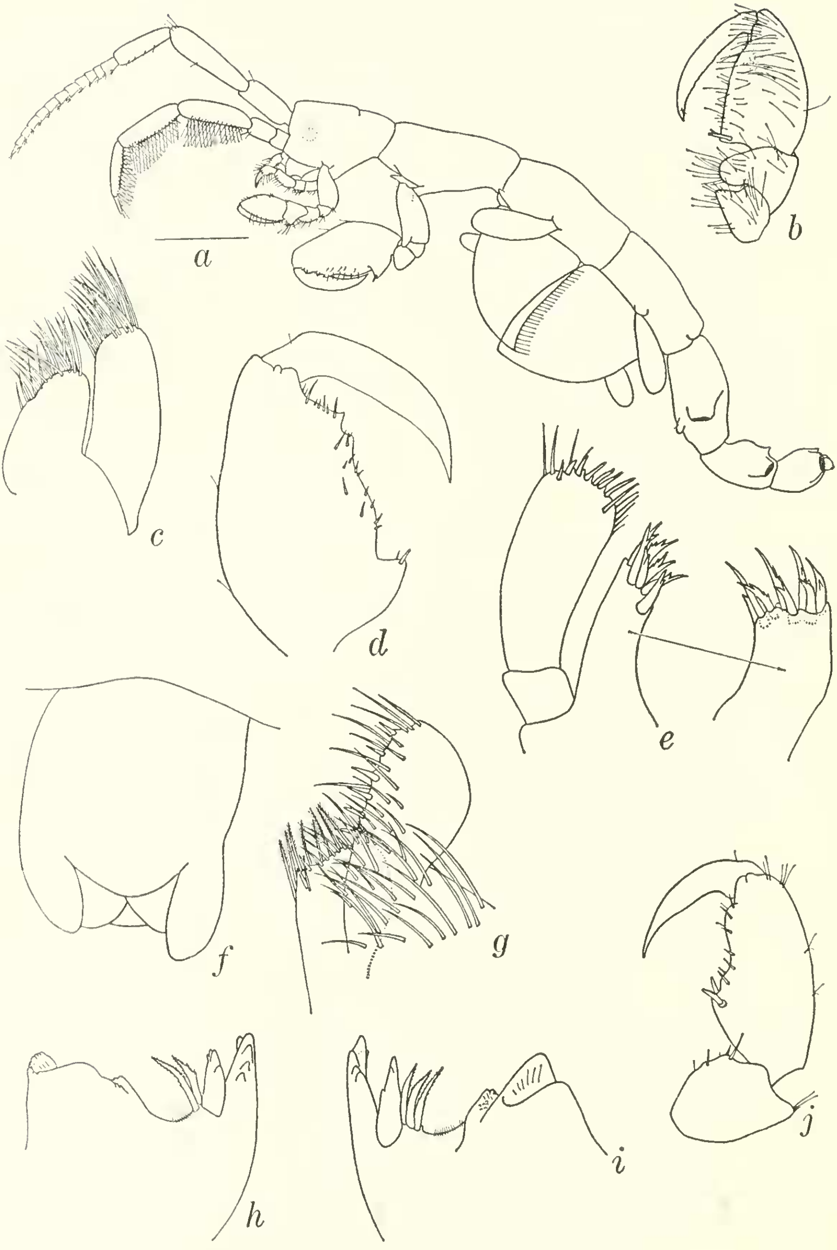

FIGURE 13.—*Caprella equilibra*, female; *a*, lateral view; *b*, gnathopod 1; *c*, maxilla 2; *d*, gnathopod 2; *e*, maxilla 1; *f*, abdomen; *g*, inner and outer lobes of maxilliped; *h*, right mandible; *i*, left mandible; *j*, pereopod 6.

Propodus of pereopods 5–7 robust with 2 proximal grasping spines, palm expanded slightly near grasping spines and with numerous setae.

Abdomen of male and female typical of genus.

VARIATION.—In the western North Atlantic this species is constant in most of its characters; however, a variant occurs along the coast of Virginia, North Carolina, and South Carolina in which the spine between the insertions of gnathopods 2 is reduced or absent. In this variant the propodus of the pereopods is less robust and the body not quite so stout as in the typical *C. equilibra*.

Off Virginia this variant was taken on *Leptogorgia*. This association may have some relation to the reduction of the spine and stoutness of the pereopods since *C. penantis* taken from *Leptogorgia* showed a loss of grasping spines on the propodus of the pereopods (p. 35).

DISTRIBUTION.—Type locality: South Carolina. ". . . I found them common in the bay of Charleston, particularly at Sullivan's island, on the two species of Gorgonia so common in the salt water creeks of our southern coast" (Say, 1818).

Other records: Sweden and Norway to the Mediterranean Sea including the British Islands; Black Sea [?]; Azores; tropical West Africa; St. Helena Island; South Africa; Madagascar; Mid-North Atlantic and Sargasso Sea; Bermuda; east coast of United States from Connecticut to Georgia (Procter, 1933, cites this species from Mount Desert Region, Maine); Port Aransas, Texas; Puerto Cabello, Venezuela; Cabo Frio and Rio de Janeiro, Brazil; Mid-South Atlantic off Brazil; Mar del Plata, Argentina; Valparaiso, Chile; Taboga Island, Panama; between Panama and the Galapagos Islands; California; Hawaii; Nagasaki, Mukaijima, and Saganoseki, Japan; Philippine Islands; Cook Strait; New South Wales, Victoria, Fremantle, Australia; New Zealand; Tasmania; Hong Kong; Singapore, Malaysia.

New records: Fernandina, entrance to St. Johns River, St. Augustine, Daytona, Cape Kennedy, off Ft. Lauderdale, Biscayne Bay, and Panama City, Fla.; Grand Isle, La.; Galveston and Port Isabel Tex.; Trinidad; Sacco Sao Francisco and Nictherey, Brazil; Estera de la Luna, Sonora, Mexico; Vancouver Island, British Columbia.

REMARKS.—Large males of this species are easily distinguished from the other species of *Caprella* by the large peduncular articles of antenna 1 and the long pereonites 1 and 2. In both males and females the cephalon is flattened anteriorly and in the typical form a spine is present between the insertions of gnathopods 2. The non-spined variant resembles other species of *Caprella* but can be identified by the short stout basis of gnathopod 2 and the other characters which are present in the typical form.

C. equilibra has been collected from various habitats including sea grass, red and green algae, sponges, hydroids, stylasterines, alcyonarians, bryozoans, and colonial ascidians. It was also taken from the egg mass of a blue crab and from the gut of a sea bass *Centropristis*. This species ranges in depth from the surface to ?3000 m (McCain, 1966).

In an aquarium it was preyed upon by the grass shrimp *Palaemonetes*, the blenny *Blennius*, and the small (2 mm) snail *Astyris* was observed severing the cephalon from a large male (12 mm). When *C. equilibra* was offered small pieces of bivalves or bryozoans it would accept them readily. It was also observed catching small gammaridean amphipods such as *Ampithoe* and *Jassa* and also several small polychaetes. Initially the prey was seized in gnathopod 1 and then brought to the mouthparts. Gnathopod 2 was seldom used in the capture of prey and even when it was used, the prey was quickly passed to gnathopod 1.

Caprella linearis (Linnaeus, 1767)

FIGURES 14, 22, 51

Cancer linearis Linnaeus, 1767, p. 1056; 1769, pp. 445–446; 1788, p. 2992; 1793, p. 501.—J. Fabricius, 1793, pp. 517–518.

Onisci Scolopendroidis Pallas, 1772, p. 80, pl. 4, fig. 15a–c.

Squilla lobata Müller, 1776, p. 197.

Squilla quadrilobata Abildgaard, 1788, pp. 21–22, pl. 56, figs 4–6.

Gammarus quadrilobatus.—Abildgaard, 1789, p. 58, pl. 114, figs. 11–12.

Cancer (*Gammarellus*) *linearis*.—Herbst, 1793 ,pp. 142–144, pls. 9a, 10b.

Cancer Linnearis.—Linnaeus, 1800, p. 761.

Caprella linearis.—Bosc, 1801–02, p. 156; 1830, p. 126, pl. 15, fig. 5.—Latreille, 1802–03, pp. 324–326, pl. 57, figs. 2–5; 1803, p. 333; 1816, p. 434.—Desmarest, 1823, p. 364; 1825, p. 278.—Johnston, 1835, pp. 671–672, fig. 71.—Drapiez, 1837, p. 353.—H. Edwards, 1840, pp. 106–107.—Goodsir, 1842, p. 190, pl. 3, figs. 8–9.—White, 1847, pp. 91–92; 1850, pp. 59–60; 1857, pp. 214–215.—Cocks, 1849, p. 83.—Williams, 1854, pp. 301–312, pl. 17, fig. 6.—Gosse, 1855, p. 131, fig. 223.—Bate, 1856, p. 60; 1857, p. 151; 1862, p. 353, pl. 55, fig. 7; 1878, p. 509; 1887, p. 175.—Leydig, 1860, p. 283.—van Beneden, 1861, p. 145.—McAndrew, 1861, p. 28.—[?] Dohrn, 1866, pp. 245–250, pl. 13b.—Bate and Westwood, 1868, pp. 52–56.—Müller, 1869, pp. 40–41.—Metzger, 1869–70 (1871), p. 32; 1875, p. 278.—Boeck, 1871a, pp. 273 (193)–274 (194).—Iarzynsky, 1870, p. 316.—Parfitt, 1873, p. 250.—M'Intosh, 1874, p. 272.—Maitland, 1874, p. 245.—Meinert, 1877–78, pp. 168–171; 1880, p. 495; 1890, p. 184.—Hoek, 1879, pp. 97–161, pl. 5, figs. 1–8, 11–13, pl. 6, fig. 2, pl. 7, figs. 1–3, 11–14; 1883–84, pp. 532, 533; 1889, p. 231.—Delage, 1881, p. 153.—Mayer, 1882, pp. 58–62, figs. 17–19, pl. 4, fig. 32; 1890, pp. 63–65; 1903, pp. 109–113, pl. 4, figs. 27–35, pl. 8, figs. 19–21.—Pelsenner, 1883, p. CXXXI; 1886, p. 218.—Schneider, 1883, p. 30; 1891, pp. 111, 122; 1924 (1926), pp. 59–60.—Blanc, 1884, pp. 88–91, pl. 5, figs. 122–129.—Koehler, 1884 (1885), pp. 98–99, 117; 1885, pp. 27, 61.—Wagner, 1885, p. 169.—Fowler, 1886, p. 218.—de Guerne, 1886, p. XLIII.—Norman, 1886, p. 26; 1902, p. 483; 1905a, p. 26; 1905b, p. 85; 1907, p. 370; 1908 (1909), p. 463.—G. Sars, 1886, pp. 69, 89; 1895, pp. 657–658, pl. 236.—[?] Thomson and Chilton, 1886, p. 142.—Bonnier, 1887, pp. 354–356.—Chevreux, 1887, p. 335; 1898, p. 484.—Robertson, 1886–87 (1888), pp. 71–72.—Scott, 1887

(1888), p. 250; 1897, p. 141; 1906, pp. 174–175.—Chevreux and Bouvier, 1893, p. 143.—Lameere, 1895, p. 570.—[?] Ohlin, 1895a, pp. xvii, xix, 62–63; 1895b, p. 486.—Walker, 1895, p. 319; 1898, p. 170.—Walker and Hornell, 1896, p. 55.—Gadeau de Kerville, 1900 (1901), p. 184.—Sokolowsky, 1900, p. 162, pl. 3, fig. 16.—Ortmann, 1901, p. 155.—d'A. Thompson, 1901, p. 41.—Whiteaves, 1901, p. 219.—Lönnberg, 1902 (1903), p. 50.—[?] Hutton, 1904, p. 261.—Marine Biol. Assoc., 1904, p. 242; 1931, p. 198; 1957, p. 234.—Holmes, 1904 (1905), pp. 526–527.—M. Rathbun, 1905, pp. 7, 78.—Norman and Scott, 1906, pp. x, 98.—Reibisch, 1906, pp. 217–218, 219, 220, 221, 222, 229, 230, 233.—Sinel, 1906 (1907), p. 222.—Brüggen, 1907, p. 238.—Norman and Brady, 1910, pp. 75–76.—Nordgaard, 1911 (1912), p. 24.—Massy, 1911 (1912), pp. 7, 22, 34, 42, 43, 45, 51, 68, 70, 73, 82, 169.—Sumner, Osburn, and Cole, 1911 (1913), p. 657.—Tattersall, 1913, pp. 20, 22.—Derjugin, 1915, pp. 453, 456; 1928, p. 282.—Björck, 1915, p. 35; 1916, p. 9.—Chumley, 1918, pp. 52, 85, 165.—Kunkel, 1918, pp. 177–178, fig. 54.—Funke, 1922, p. 197.—Chevreux and Fage, 1925, pp. 456–457, fig. 434 [in part].—Derjavin, 1927, p. 14.—Stephensen, 1927a, p. 149; 1927b, p. 13; 1928, pp. 382–384, fig. 92 (1–4); 1929a, p. 179, fig. 333; 1929b, pp. 19, 34; 1935, p. 118; 1940, p. 73; 1942, pp. 436–437, 502, 503; 1944b, p. 159.—Johansen, 1930, p. 94.—Shoemaker, 1930, p. 353 (135).—[?] Arimoto, 1931, pp. 13–14, fig. 9.—Gurjanova, 1931, p. 201; 1964, p. 313.—Oldevig, 1933, pp. 264–266.—Procter, 1933, p. 256.—Dons, 1935, p. 110.—Schellenberg, 1942, pp. 237–238, fig. 197.—Dahl, 1946, p. 22.—[?] Utinomi, 1947, p. 75.—Stock and Bolklander. 1952, pp. 3–4.—Bousfield, 1956b, p. 145; 1958, p. 315.—Brunel, 1961, p. 7.—Toulmond and Truchot, 1964, p. 35.

Caprella Linearis.—Leach, 1814, p. 404.—Risso, 1816, p. 130.—Couch, 1864, p. 98.

[?]*Caprella Punctata* Risso, 1816, pp. 130–131; 1826, p. 102.—Carus, 1885, p. 389.

Caprella laevis Goodsir, 1842, pp. 189–190, pl. 3, figs. 4–5.—White, 1847, p. 92; 1850, p. 60; 1857, p. 215.—Gosse, 1855, p. 131.—Bate, 1856, p. 60.

[?]*Caprella phasma* [not Montagu].—Rathke, 1843, pp. 94–96.

[?]*Caprella acuminifera* [not Leach].—Rathke, 1843, p. 96.

[?]*Caprella scolopendroides* [not Lamarck].—Rathke, 1843, p. 97.

Caprella lobata.—Bate, 1856, p. 60; 1857, p. 151; 1862, p. 354, pl. 55, fig. 8; 1878, p. 509; 1887, p. 175.—Bate and Westwood, 1868, pp. 57–59.—Parfitt, 1873, p. 250.

Caprella linearis f. *gullmarensis* Mayer, 1903, p. 112, pl. 8, fig. 20.

Caprella linearis f. *distalis* Mayer, 1903, p. 113, pl. 4, figs. 27–28.

Diagnosis.—Body smooth or with only few spines, peduncle of antenna 1 usually with numerous setules, ratio of total length to length of basis of gnathopod 2 usually less than 13.0, inner surface of gnathopod 2 with small tooth adjacent to poison tooth.

Distribution.—Type-locality: "Habitat in Oceano Europaeo" (Linnaeus, 1767).

Other records: Siberian Polar Sea to 140° E.; Murman coast; Spitsbergen; Norway to France; British Islands; Faeroe Islands; Iceland; coast of North America from Labrador to Connecticut; [?]Kamchatka, Japan, and New Zealand.

New records: The material available to me does not extend the range of this species.

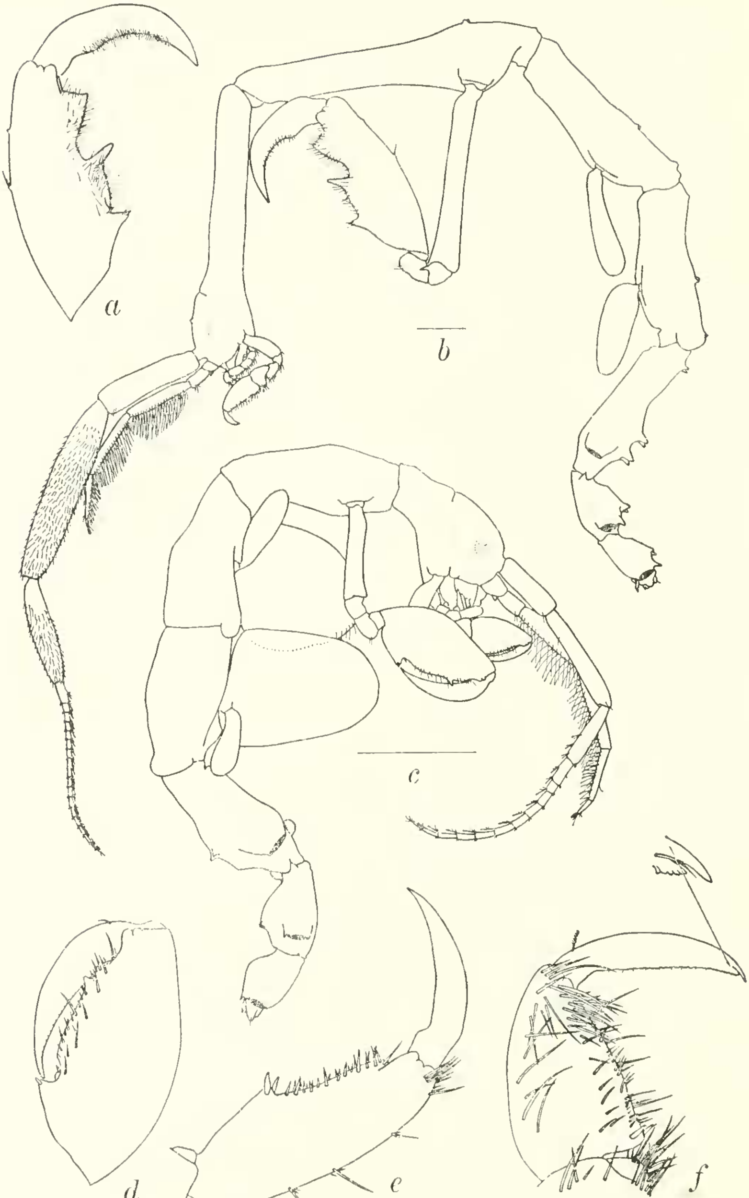

FIGURE 14.—*Caprella linearis; a*, male gnathopod 2; *b*, male lateral view; *c*, female lateral view; *d*, female gnathopod 2; *e*, female pereopod 6; *f*, female gnathopod 1.

REMARKS.—The appendages of *C. linearis* are quite similar to those of *C. septentrionalis* and are discussed under the latter species.

C. linearis does not appear to be specific in its habitat, having been collected from brown, green, and red algae, sea grass, sponges, hydroids, alcyonarians, and tunicates. Ohlin (1895a) reported it from an *Asterias* collected off Newfoundland. This report may refer to *C. unica* since the body form and most of the appendages of these species are quite similar and *C. unica* has been collected off Newfoundland. Mayer (1903) also reported *C. linearis* from an asteroid, *Solaster*, which was collected off Scotland.

C. linearis has been taken from the surface to a depth of several hundred meters.

Caprella longimanus Stimpson, 1853

Caprella longimanus Stimpson, 1854 (1853), p. 44.—Whiteaves, 1901, p. 220.—Bate, 1862, pp. 360–361.

Caprella longimana.—Mayer, 1882, p. 66; 1890, p. 73.

REMARKS.—A caprellid from Grand Manan was described by Stimpson as

Body with a few spines along the back of each segment. Superior antennae rather stout and twice as long as the inferior ones, which are very slender. Hands very long and rather broad, with two or three teeth along the inner edge; the arms to which they belong are placed on the thickened posterior part of the second segment. Color light-yellowish brown. Eyes red. Length about three-fourths of an inch.

From this description it is impossible to tell to which species Stimpson is referring. It might be *C. septentrionalis* because of the mention of a few dorsal spines, but several other species bear spines.

Caprella penantis Leach, 1814

FIGURES 15, 16, 51

[?]*Cancer Atomos* Linnaeus, 1767, p. 1056; 1769, pp. 446–447; 1788, pp. 2992–2993; 1793, p. 501; 1800, p. 761.—Pennant, 1777, p. 21, pl. 12, fig. 32.

Caprella Penantis Leach, 1814, p. 404.

Caprella acutifrons Latreille, 1816, p. 433.—[?] Desmarest, 1823, p. 363; [?] 1825, p. 277.—[?] Drapiez, 1837, p. 353.—[?] H. Edwards, 1840, p. 108.—[?] White, 1847, p. 92; [?] 1850, p. 60; [?] 1857, p. 216.—[?] Cocks, 1849, p. 83.—[?] Gosse, 1855, p. 131.—[?] Bate, 1856, p. 60; [?] 1862, p. 356, pl. 56, fig. 6; [?] 1878, p. 509; [?] 1887, p. 175.—[?] Bate and Westwood, 1868, pp. 60–62.—[?] Parfitt, 1873, p. 250.—[?] Maitland, 1874, p. 245.—[?] Stalio, 1877, p. 1125.—[?] Haller, 1879a, p. 232; [?] 1879b, p. 404.—Mayer, 1882, pp. 48–50, pl. 1, fig. 9, pl. 2, figs. 12–22, pl. 4, figs. 26–28, pl. 5, figs 15, 22, 23 [in part]; 1890, pp. 50–57, pl. 2, figs. 34–41, pl. 4, figs. 52–71, pl. 7, figs. 16–17 [in part]; 1903, pp. 79–89, pl. 3, figs. 4–28, pl. 7, figs. 62–65 [in part].—[?] Delage, 1881, pp. 131–132, 155, pl. 10, figs. 11–12.—Stossich, 1881, p. 230.—[?] Marion, 1883, p. 49.—[?] Carus, 1885, p. 388.—[?] Norman, 1886, p. 26; [?] 1905a, p. 26; [?] 1905b, p. 85; [?] 1907, p. 370; [?] 1908 (1909), p. 463.—[?] Pelseneer, 1886, p. 218.—[?] Bonnier, 1887, p. 353.—[?] Chevreux, 1887a, pp. 318, 335; [?] 1888, p. 33; [?] 1898, p. 483; 1900, pp. 119–120.—[?] Barrois, 1888, pp. 57–58, 77.—[?] Vosseler, 1889, p. 159.—[?] Walker and Hornell, 1896, p. 54.—[?] Gadeau de Kerville, 1898, p. 348; [?] 1900 (901), p. 184.—[?] Walker, 1898, p. 170.—[?] Beaumont, 1900, p. 795.—[?] d'A. Thompson, 1901, p. 41.—M. Rathbun, 1905, pp. 7, 77–78.—[?] Norman and Scott, 1906, pp. vii, 99.—[?] Sinel, 1906 (1907), p. 222.—Chilton, 1910 (1911), pp. 546, 567.—[?] Monterosso, 1915, p. 15, fig. 3.—[?] Galdiano, 1924, p. 392.—Richards, 1929, p. 84; 1938, p. 213, pl. 24, fig. 7.—Cowles, 1930, p. 351.—[?] Mar. Biol. Assoc., 1931, p. 198; [?] 1957, p. 233.—Barnard, 1932, p. 300; 1965, p. 209.—Procter, 1933, p. 256.—[?] MacGinitie, 1935, p. 701.—Schellenberg, 1938, pp. 95, 98.—[?] Ricketts and Calvin, 1939, pp. 70–71; [?] 1952, p. 68.—[?] Bertrand, 1941, pp. 12, 13, 14.—Pearse, Humm, and Wharton, 1942, p. 184.—Dexter, 1944, p. 356.—[?] MacKay, 1945, p. 205.—[?] Hewatt, 1946, pp. 194, 196, 199, 200, 201, 202, 204.—[?] Ruffo, 1947, p. 129.—Edmondson ad Mansfield, 1948, pp. 212–214, fig. 6.—Ferguson and Jones, 1949, p. 442.—[?] Stephensen, 1949, p. 54.—Hedgpeth, 1950, pp. 77–78.—Ellis, 1950, p. 13.—[?] Tuzet and Sanchez, 1952, pp. 26–36, figs. 1–3, 1–4, 1–5, fig. 4.—Duke Univ. Mar. Lab., 1953, p. 22.—[?] Macnae, 1953, p. 1032.—Bousfield, 1956b, p. 145; 1958, pp. 315, 321.—Menzel, 1956, p. 41.—Pearse and Williams, 1951, p. 143.—[?] Stschapova, Mokyovsky, and Pasternak, 1957, p. 87.—[?] Costa, 1960a, pp. 99, 100.—Wells, 1961, pp. 247, 249.—[?] Toulmond and Truchot, 1964, p. 35.

Caprella geometrica Say, 1818, pp. 390–391.—de Kay, 914, p. 41.—White, 1847, p. 92.—Gibbes, 1848, p. xvi; 1849, p. 23.—Bate, 1862, p. 357, pl. 56, fig. 8.—Verrill and Smith, 1873, pp. 316–317, 480, 567, pl. 5, fig. 20.—Uhler, 1879, pp. 26–27.—R. Rathbun, 1880 (1881), p. 121.—Norman, 1886a, p. 26; 1905, p. 26.—Holmes, 1904 (1905), p. 526.—Paulmier, 1905, p. 168, fig. 38.—Kunkel, 1918, pp. 178–180, fig. 55.—Sumner, Osborn, and Cole, 1911 (1913), pp. 132, 134, 135, 657, chart 102.—Pearse, 1913, p. 378. LaFollette, 1914, pp. 222–223, pl. 1–3.—Allee, 1922, p. 58; 1923, p. 213.—Wood and Wood, 1932, p. 18.—McCain, 1965, pp. 194–196, figs. 1c,g, 2a–f.

Caprella Pennantii.—[?] Johnston, 1835, p. 671.—[?] Bate, 1856, p. 60; [?] 1857, p. 151.—[?] McAndrew, 1861,p. 28.—[?] Couch, 1864, p. 97.

[?] *Caprella spinifrons* Nicolet, 1849, p. 253.—Mayer, 1882, p. 70; 1890, p. 74.—Reed, 1897, p. 11 (4).

[?] *Caprella obesa* van Beneden, 1861, pp. 99, 146.

Caprella Acutifrons.—[?] Herklots, 1861, p. 43.

[?] *Caprella novae-zealandiae* Kirk, 1878, pp. 465–466; 1878 (1879), p. 393.—Thomson, 1879, p. 330.

[?] *Caprella Novae-Zealandiae*.—Mayer, 1882, pp. 71–72; 1890, p. 76.

[?] *Caprella penantii*.—Bate, 1887, p. 175.

Caprella acutifrons f. *tabida* Mayer, 1890, pp. 54–55, pl. 2, fig. 36, pl. 4, figs. 52, 61.

Caprella acutifrons f. *neglecta* Mayer, 1890, p. 55, pl. 2, fig. 37, pl. 4, figs. 57–58, 67; 1903, p. 80.—Utinomi, 1943a, pp. 273–274, figs. 2a, 3a; 1943b, pp. 282–283, fig. 2; 1943c, p. 284, fig. 1; 1947, p. 72.

[?] *Caprella acutifrons* f. *gibbosa* Mayer, 1890, p. 55, pl. 2, fig. 39, pl. 4, figs. 55, 69.

Caprella acutifrons f. *carolinensis* Mayer, 1890, p. 56, pl. 2, fig. 40, pl. 4, figs. 59, 65.

[?] *Caprella acutifrons* f. *lusitanica* Mayer, 1890, p. 56, pl. 4, figs. 53, 66.

Caprella acutifrons f. *virginia* Mayer, 1890, p. 56, pl. 2, fig. 41, pl. 4, fig. 60.

Caprella acutifrons f. *natalensis* Mayer, 1903, p. 81, pl. 3, figs. 22, 23.—Arimoto, 1930, pp. 48–49, fig. 3.—Hiro, 1937, p. 312, pl. 22, fig. 5.—Stephensen, 1949, pp. 53–54, 56.

Caprella acutifrons f. *porcellio* Mayer, 1903, pp. 81–82.

Caprella acutifrons f. *testudo* Mayer, 1903, p. 82.—Chevreux and Fage, 1925, p. 452, fig. 430t.
Caprella acutifrons f. *angusta* Mayer, 1903, p. 82, pl. 3, fig. 4.
Caprella acutifrons f. *tibada* Mayer, 1903, p. 80.
Caprella penantis.—Stebbing, 1910b, p. 653.—[?] Hale, 1929, pp. 233–234.—[?] Schellenberg, 1931, pp. 266, 272.
Caprella penantis f. *natalensis*.—Stebbing, 1910a, pp. 465–466.—Barnard, 1916, pp. 281–282.
Caprella penantis f. *porcellio*. —Stebbing, 1910a, p. 466.
Caprella angusta.—Dougherty and Steinberg, 1953, pp. 44, 47; 1954, p. 171.—Johnson and Juskevice, 1965, p. 38.
Caprella carolinensis.—Steinberg and Dougherty, 1957, pp. 270–273, figs. 3–7.

Diagnosis.—Cephalon with anteriorly directed triangular projection; peduncle of antenna 1 not inflated; basis of gnathopod 2 shorter than pereonite 2; pereopods concave, grasping spines proximal.

Description.—Body smooth except cephalon with anteriorly directed triangular projection. Length of largest male 14 mm, largest female 12 mm, smallest ovigerous female 4 mm.

Peduncle of antenna 1 not inflated, flagellum with up to 15 articles. Antenna 2 usually longer than peduncle of antenna 1.

Mouthparts typical of genus, lacinia mobilis of right mandible toothed but indistinctly 5-toothed.

Propodus of gnathopod 1 with 2 proximal grasping spines, grasping margin of dactylus and propodus serrate. Propodus of gnathopod 2 with proximal poison tooth, palm concave in males and slightly convex in females with distal elevated rectangular projection; grasping margin of dactylus serrate.

Gills usually ovate, occasionally elliptical.

Propodus of pereopods 5–7 usually with pair of proximal grasping spines, pereopods increasing in length from 5 to 7.

Abdomen of male and female typical of genus.

Variation.—In the area around Alligator Harbor, Fla., *C. penantis* taken on *Leptogorgia* showed a reduction or loss of grasping spines on the propodus of pereopods 5–7. Approximately 90 percent of the specimens taken during the summer of 1966 lacked grasping spines and remaining 10 percent had either 1 or 2 grasping spines. Other specimens of this species taken during that summer on algae and hydroids had the usual pair of grasping spines. It is interesting to note that *C. equilibra* taken on *Leptogorgia* off Virginia showed a reduction or loss of the ventral spine between the insertions of gnathopods 2.

As I illustrated in 1965 (p. 195, fig. 2a–f) the shape of the propodus of gnathopod 2 changes with an increase in the size of the individual. In smaller individuals of approximately 4 or 5 mm, gnathopod 2 resembles gnathopod 1 and bears a pair of grasping spines. As the

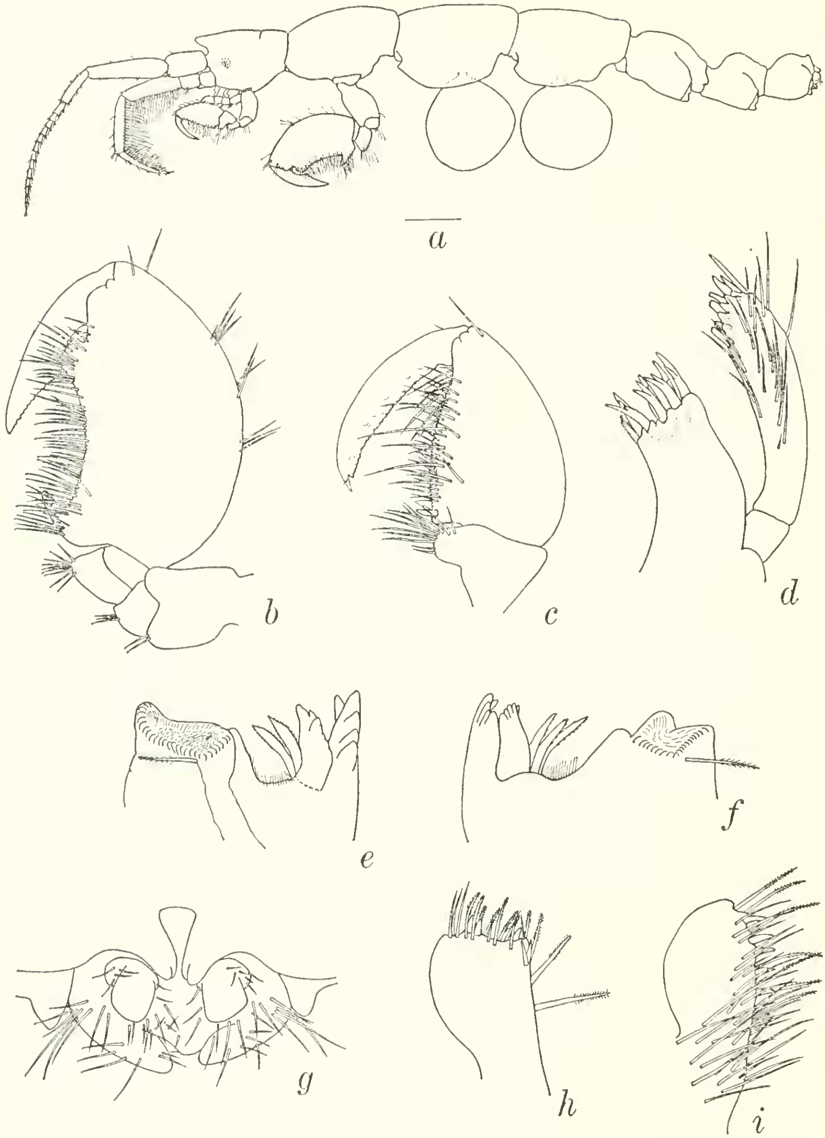

FIGURE 15.—*Caprella penantis*, male; *a*, lateral view; *b*, gnathopod 2; *c*, gnathopod 1; *d*, maxilla 1; *e*, right mandible; *f*, left mandible; *g*, abdomen; *h*, inner lobe of maxilliped; *i*, outer lobe of maxilliped.

individual increases in size there is a progressive loss of 1, then of both spines, and a notch develops in the palm.

Stoutness of the body and the degree of pleural development appear to be a function of growth, larger individuals having a robust body and well-developed pleura.

M. le Président met sous les yeux de la Société, de la part de M. Balsamo, des échantillons de fruits de Cotonniers hybrides récoltés dans l'Italie méridionale, et notamment sur des hybrides de Coton nankin et de Coton blanc.

SÉANCE DU 13 MARS 1868.

PRÉSIDENCE DE M. DUCHARTRE.

M. Larcher, vice-secrétaire, donne lecture du procès-verbal de la séance du 28 février 1868, dont la rédaction est adoptée.

A l'occasion des dons faits à la Société, M. le Président appelle l'attention des membres de la Société, sur un mémoire de M. Woronin relatif à un *Chytridium* (Algue unicellulée qui se développe à l'intérieur des cellules des végétaux vivants).

M. Éd. Bureau annonce à la Société qu'il a reçu du Brésil, de M. de Mello, des graines d'environ trente espèces de Bignoniacées. Il fait remarquer qu'un très-petit nombre d'espèces de cette famille sont cultivées dans les serres d'Europe, et il espère enrichir, par des semis, la culture des Bignoniacées; ce qui permettra plus tard d'étudier sur la plante vivante la structure des lianes.

M. Eug. Fournier donne lecture de la communication suivante adressée à la Société :

LA VRILLE DE LA VIGNE, par M. T. CARUEL.

(Florence, février 1868.)

Pendant longtemps la science a accepté sans conteste l'explication morphologique de la vrille oppositifoliée de la Vigne, qui voyait dans cet organe la continuation de l'axe de la tige ou branche, déjetée de côté par le développement exubérant d'un bourgeon né à l'aisselle de la feuille faisant face à la vrille. Ce n'est que dans ces dernières années que cette théorie a été fortement ébranlée par une remarque aussi simple qu'ingénieuse de M. Prillieux, consignée dans le *Bulletin* (tome III, pp. 645 et suiv.). Ce botaniste a fait observer que dans les bourgeons réellement axillaires de la Vigne, les jeunes feuilles sont disposées selon un plan qui croise celui des feuilles de la tige ou branche qui porte le bourgeon ; et comme il n'en est pas de même pour les feuilles de l'axe prétendu secondaire et usurpateur, par rapport à celles de l'axe primaire, il en these, *C. acutifrons* f. *angusta* (1903), *borealis* (1903), *incisa* (1903), and *verrucosa* (1903) (=*C.verrucosa* Boeck, 1871b) have since been given specific rank. In the present paper one other variety, *C. acutifrons* f. *andreae*, is accorded specific rank, leaving 14 varieties in question.

The varieties *C. acutifrons* f. *typica* (1890), *minor* (1890), *tabida* (1890), and *tibada* (1903) differ from the remaining varieties primarily by the distal position of the poison tooth on the palm of the propodus of gnathopod 2. Mayer recognized *C. acutifrons* f. *typica* and *minor* from Rio de Janeiro, Brazil, the latter variety being based on a smaller individual than the former. Krøyer (1842–43) described *C. dilatata* from Rio de Janeiro. All of the abovementioned varieties should be assigned to *C. dilatata*. Juveniles of this species bear a small proximal tooth on the palm of gnathopod 2, which is very short and spinelike and is not present on individuals larger than approximately 8 mm.

In 1903 Mayer changed the 1890 variety *tabida* to *tibada* and recognized *C. tabida* Lucas, 1849, as a different variety. *C. acutifrons* f. *tabida* (1903) (=*C. tabida* Lucas, 1849), *C. acutifrons* f. *simulatrix* (1903), *C. pilimana* Dougherty and Steinberg, 1953, and *C. obtusifrons* Utinomi, 1943c, differ from the remaining varieties by the lack of a poison tooth on the palm of gnathopod 2. Specimens of the first two varieties and of *C. obtusifrons* have not been examined so I cannot make any statement on their validity.

Caprella acutifrons f. *cristibrachium* (1903) lacks a triangular projection on the cephalon and the shape of gnathopod 2 is quite different from that of the other members of the *C. acutifrons* group. It is doubtful that it is a variety of this group and probably should be given specific rank.

The remaining varieties, *C. acutifrons* f. *carolinensis* (1890), *virginia* (1890), *testudo* (1903), *gibbosa* (1890), *lusitanica* (1890), *natalensis* (1903), *porcellio* (1903), and *neglecta* (1890), are quite similar in the shape of gnathopod 2 and general body form. In the first five varieties the palm of the propodus of gnathopod 2 is quite setose and in the last three varieties and *C. angusta* the palm is scarcely setose. I have been unable to find other distinguishing characters for these varieties, so I have tentatively assigned them to the species *C. penantis*.

Dougherty and Steinberg (1953) gave *C. acutifrons* f. *angusta*, *incisa*, and *verrucosa* specific rank. These varieties occur together on the California coast and have been collected simulatneously from the same hydroid. Since they are sympatric and no morphological intergradations were observed, all of these varieties cannot be ascribed to the same species. I agree with Dougherty and Steinberg's decision to give them specific rank; however, they do not state how *C.*

angusta differs from the typical *C. penantis*. Specimens of *C. angusta* have been compared with specimens which Mayer identified as *C. acutifrons* f. *natalensis* and *neglecta* and with specimens which I earlier (1965) identified as *C. geometrica*. With the exception of the setose versus nonsetose palm of gnathopod 2, I can find no variation which is not ascribable to size differences. I have therefore synonymized *C. angusta* with the typical *C. penantis*.

The specimens from Cayenne, French Guiana, belong to that portion of *C. penantis* which bears almost no setae on the palm of gnathopod 2. It might well be that *C. penantis* could be divided into two subspecies on the basis of the setation of gnathopod 2; however, material from Chile, Australia, and New Zealand would have to be examined since Nicolet's name *C. spinifrons* or possibly Kirk's name *C. novae-zealandiae* would probably have priority over one of Mayer's varietal names. Material is not available to me from these areas so I have refrained from naming subspecies.

Kirk's (1878) description of *C. novae-zealandiae* agrees with that of *C. penantis*, and he states that his species is close to *C. geometrica*. Thomson and Chilton (1885, 1886) synonymized *C. novae-zealandiae* with *C. equilibra;* however, Kirk states "Cephalon furnished with a spinous tooth directed forwards." It seems unlikely that Kirk could have been referring to *C. equilibra*, so I have synonymized his species with *C. penantis*.

In my synonymy, when a reference to the variety of *C. acutifrons* or *C. penantis* is not indicated, this lack of designation is indicated by a question mark in brackets before the author or date. Such records are not included in the distribution of this species, so it is possible that *C. penantis* might also be found as far north as Spitsbergen, the Mediterranean Sea, the Falkland Islands, Chile, Cook Strait, and the Bering Sea.

This species is probably the most common caprellid along the east coast of the United States. It occurs in such abundance from Long Island to Chesapeake Bay that I have had several reports that it is a pest to swimmers. One report from Sinepuxent Bay, Md. stated that *C. penantis* fastens itself to the exposed parts of swimmers' bodies and either bites or sucks, causing an irritation that forms a blister which lasts for a week or more. Such an irritation might be caused by the associated hydroids and not by the caprellid itself, but this possibility has not been verified.

C. penantis is quite nonspecific in its habitat preference and has been taken on various red and brown algae, sea grass, sponges, hydroids, alcyonarians, zoantharians, and bryozoans. Chilton (1911) reports that this species was collected from a coconut which was washed ashore; I have found it clinging to the spines of the echinoid

Arbacia and on hydroids which were attached to the carapace of the spider crab *Libinia.*

Caprella sanguinea Gould, 1841

Caprella sanguinea Gould, 1841, pp. 335–336.—de Kay, 1844, p. 41.—Stimpson, 1854 (1853), p. 44.—Bate, 1862, p. 360.—Mayer, 1882, p. 67; 1890, p. 73.—Whiteaves, 1901, p. 219.

REMARKS.—This species from Massachusetts was described by Gould as:

> . . . an inch in length, entirely crimson except its black eyes. The head is blunt, the lower antennae ciliated and extending to the second segment, and the upper ones to the third segment; first two segments nearly as long as the three next, and about one third of the whole length; on the middle of the first is a spine; two last segments short and heart-shaped. Hands having a long curved finger; an imperfect thumb on the second pair of legs; a tubercule at the base of the ovate carpus, and a small spine at the middle. This might be called *C. sanguinea,* from its color, which it retains in spirits.

Like Stimpson's *C. longimanus,* this species is unidentifiable and it might also belong to *C. septentrionalis.*

Caprella scaura Templeton, 1836

FIGURES 17, 18, 55

Caprella scaura Templeton, 1836, pp. 191–192, pl. 20 fig. 6.—H. Edwards, 1840, p. 107.—Bate, 1862, p. 355, pl. 56, fig. 4.—Mayer, 1882, p. 65; 1890, pp. 70–73, pl. 4, figs. 40–51, pl. 6, fig. 41, pl. 7, figs. 2, 35–36 [in part]; 1903, pp. 117–120, pl. 5, figs. 13–18, pl. 10, fig. 11 [in part].—Walker, 1916, p. 346.—Barnard, 1925, pp. 371–372.—Hale, 1927, p. 315; 1929, p. 234, fig. 229.—Arimoto, 1931, pp. 16–18, pl. 3, figs. 1–6.—Hiro, 1937, pp. 314–315, fig. 3, pl. 22, figs. 11–12.—Day and Morgan, 1956, p. 303.

Caprella nodosa Templeton, 1836, pp. 192–194, pl. 21, fig. 7.—H. Edwards, 1840, p. 108.—Bate, 1862, p. 357, pl. 56, fig. 7.

Caprella cornuta Dana, 1853, pp. 816–817; 1855, pl. 54, fig. 5.—Bate, 1862, p. 356, pl. 56, fig. 5.—Mayer, 1882, p. 68.—Chilton, 1921, pp. 90–91, fig. 4.—Oliveira, 1940, p. 139.

Caprella cornuta f. *obtusirostris* Dana, 1853, p. 817; 1855, pl. 54, fig. 6.

Caprella attenuata Dana, 1853, pp. 817–819; 1855, pl. 55, fig. 1.—Bate, 1862, p. 364, pl. 57, fig. 7.—Mayer, 1882, pp. 67–68, figs. 24–25; 1890, p. 73.—Haswell, 1885, p. 1000.

Caprella attenuata f. *subtenuis* Dana, 1853, pp. 818–819; 1855, pl. 55, fig. 1c.

Caprella scaura f. *typica* Mayer, 1890, p. 71, pl. 4 figs. 48–49; 1903, p. 118.—Miyadi and Masui, 1942, p. 10.—Utinomi, 1947, p. 77.

Caprella scaura f. *diceros* Mayer, 1890, p. 71; 1903, p. 118.—Miyadi and Masui, 1942, p. 10.—Utinomi, 1943a, p. 279; 1943b, p. 285, fig. 5; 1947, p. 77.

Caprella scaura f. *cornuta* Mayer, 1890, pp. 71–72, pl. 4, figs. 50–51; 1903, pl. 118.

Caprella scaura f. undetermined Mayer, 1903, p. 120.

Caprella scaura f. *hamata* Utinomi, 1947, p. 77, fig. 7.

DIAGNOSIS.—Cephalon with anteriorly directed spine, pereonites 1–2 elongate in males, basis of gnathopod 2 approximately length of pereonite 2.

Description.—Body with anteriorly directed cephalic spine, female with variously developed spines on pereonites 1–7. Length of largest male 21 mm, female 12 mm, smallest ovigerous female 6 mm.

Antenna 1 usually longer than one-half body length, flagellum with as many as 9 fused articles in males, up to 4 in females. Length of antenna 2 variable.

Mouthparts typical of genus, lacinia mobilis of right mandible not distinctly 5-toothed.

Propodus of gnathopod 1 with 2 proximal grasping spines, grasping margin of dactylus and propodus serrate. Propodus of gnathopod 2 elongate in males, palm with 2 strong teeth and distal rectangular projection; female propodus not so elongate as male, palm with proximal spine, small distal tooth and distal rectangular projection.

Gills elliptical.

Propodus of pereopods 5–7 with 2 proximal grasping spines.

Abdomen of male and female typical of genus except with raised medial projection.

Variation.—The females with the most pronounced dorsal body spination had 1 knob at the posterior of pereonite 1, 1 pair of knobs above the gills on pereonites 3 and 4, 1 knob at the posterior of pereonite 4, 2 pairs of knobs at midlength of pereonite 5, 1 pair of knobs at midlength of pereonite 6, and a pair of knobs at the posterior of peronite 7. This spination showed varous degrees of reduction from this pattern with the knob at the posterior of pereonite 4 usually being present. The males occasionally bore 2 pairs of knobs at midlength of pereonite 5 and a pair of knobs at midlength of pereonite 6.

The number of fused articles in the flagellum of antenna 1 varied from 6–9 in males and from 2–4 in females. Mayer used this character for separating *C. scaura* f. *cornuta* from *C. scaura* f. *typica* and *diceros* since *C. scaura* f. *cornuta* does not have fused articles in the flagellum of antenna 1.

Distribution.—Type-locality: Riviere Noire, Mauritius.

Other records: St. Croix and St. Barthélemy, Virgin Island; Vitoria, Rio de Janeiro, and 28° S., Brazil; South Africa; Mejillones, Chile; Cumberland Bay, Isla Más a Tierra; Honshu, Kyushu, and the Inland Sea, Japan; Vladivostok; Sydney and Kangaroo Island, Australia.

New records: Cocos Island, Costa Rica; off Mayagüez, Puerto Rico; Ilha Sao Sebastiao and Santa Catarina, Brazil; False Bay, South Africa.

Remarks.—Mayer (1890, 1903) described 6 varieties of *C. scaura* to which Utinomi (1947) added a seventh, *C. scaura* f. *hamata*. Mayer's varieties *C. scaura* f. *typica* (1890), *diceros* (1890), *cornuta* (1890),

FIGURE 17.—*Caprella scaura*, male; *a*, lateral view; *b*, gnathopod 1; *c*, maxilla 2; *d*, maxilla 1; *e*, gnathopod 1; *f*, right mandible; *g*, abdomen; *h*, left mandible; *i*, inner and outer lobes of maxilliped.

FIGURE 18.—*Caprella scaura*, female; *a*, lateral view; *b*, inner and outer lobes of maxilliped; *c*, gnathopod 2; *d*, maxilla 1; *e*, abdomen; *f*, gnathopod 1; *g*, righ mandible; *h*, left mandible.

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and Utinomi's *C. scaura* f. *hamata* do not bear a ventral spine between the insertions of gnathopods 2 as do Mayer's varieties *californica* (1890), *scauroides* (1903), and *spinirostris* (1890).

Dougherty and Steinberg (1953) separated *C. scaura* f. *californica* as a distinct species and reestablished Stimpson's (1857) name *C. californica*. This action was justified; however, they did not state what should be done with the other two varieties which bear the ventral spine. These varieties are closely related and appear to be limited to the North Pacific. No material of the Asian varieties is available to me and I am not able to comment on their taxonomic position. The synonymy, therefore, includes only those references which refer to those varieties which do not bear the ventral spine.

Barnard (1925) considered *C. laevipes* Mayer, 1903, a synonym of *C. scaura*. *C. laevipes* appears to be distinct from *C. scaura* since the pereopods do not bear grasping spines and Barnard's synonymy has not been followed.

The Caribbean material appears to be most closely related to *C. scaura* f. *typica* which has previoulsy been taken from St. Croix and St. Barthélemy.

C. scaura has been taken on red and brown algae, sea grass, bryozoans, and on a sea urchin.

Caprella septentrionalis Krøyer, 1838

FIGURES 19–22, 51

Squilla lobata [not Müller].—O. Fabricius, 1780, pp. 248–249.

Caprella septentrionalis Krøyer, 1838, p. 318; 1842–43, pp. 590–596, pl. 8, figs. 10–19.—Boeck, 1861, p. 677; 1870, p. 276 (196); 1873–76, pp. 696–698.—Bate, 1862, p. 355, pl. 56, fig. 3.—Goës, 1866, p. 534.—Packard, 1867, p. 297.—Lütken, 1875, p. 159.—Schiødte, 1875, p. 224, pl. 5, figs. 1–8.—Norman, 1876, p. 209; 1886, p. 26; 1902, p. 483; 1905a, p. 26.—Miers, 1877b, p. 139; 1880, p. 69.—Meinert, 1877–1878, pp. 171–172; 1880, p. 495; 1890, pp. 184–185.—M. Sars, 1858 (1859), p. 150.—Hoek, 1882, p. 65.—Mayer, 1882, pp. 62–64, figs. 20–22; 1890, pp. 65–68, pl. 2, figs. 26–33, pl. 4, fig. 31, pl. 6, fig. 38; 1903, pp. 120–123, pl. 5, figs. 19–21, pl. 8, fig. 24.—Stuxberg, 1882, p. 764; 1887, p. 73.—Schneider, 1883, p. 30; 1884, pp. 130–131; 1891, pp. 111, 122; 1924 (1926), p. 60.—Koelbel, 1886, p. 42.—G. Sars, 1886, pp. 69, 89; 1895, pp. 659–660, 700, pl. 237, fig. 1.—Hansen, 1887b, pp. 173–174.—Vosseler, 1889, p. 159.—Pfeffer, 1889 (1890), pp. 87, 94.—Klinckowström, 1892, p. 90.—Ohlin, 1895a, pp. 63–64, xvii, xix; 1895b, p. 486.—Vanhöffen, 1897, pp. 202, 203, 213.—Scott, 1899, p. 81; 1901, pp. 267–268.—Ortmann, 1901, pp. 155–156.—d'A. Thompson, 1901, p. 42.—Lönnberg. 1902 (1903), p. 50.—Holmes, 1904 (1905), p. 527.—Nordgaard, 1905, p. 185.—M. Rathbun, 1905, pp. 7, 78–79.—M. Grieg, 1907, p. 527.—Brüggen, 1909, p. 43.—Stephensen, 1913a, pp. 223–225; 1913b, p. 68; 1916, p. 295; 1927a, pp. 148–149; 1927b, p. 13; 1928, pp. 384–386, fig. 92 (5–10); 1929a, pp. 179–180, fig. 334; 1929b, pp. 20, 34; 1933, pp. 60, 77; 1935, p. 188; 1940, pp. 73–74; 1942, pp. 439–441, 502, 503; 1944b, pp. 136–137, 148, 159, 162.—Björck, 1915, p. 36.—Derjugin, 1915, pp. 453, 456; 1928, p. 282.—Oldevig, 1917, p. 40; 1933, pp. 266–269, fig. 1–2 (p. 267), figs. 1–3 (p. 268).—J. Grieg, 1925, p. 22.—Johansen, 1925, p. 204; 1930, p. 94.—Shoemaker, 1926, p. 11; 1930, pp. 353 (135)–354 (136).—Gurjanova, 1929b, p. 70; 1931, p. 201.—Dons, 1935, p. 110.—Dunbar, 1942, p. 42; 1954, pp. 784, 788.—Schellenberg, 1942, p. 238, fig. 198.—Dahl, 1946, p. 22.—Utinomi, 1943c, pp. 296–297, fig. 10; 1947, p. 78.—Stock and Bolklander, 1952, p. 4.—Bousfield, 1956a, p. 32; 1956b, p. 144; 1958a, p. 321; 1962, p. 53.—Bousfield and Leim, 1958, p. 18.—Brunell, 1961, p. 7.—Prefontaine and Brunel, 1962, p. 256.

Caprella cereopoides White, 1852, p. ccvii, fig. 1.

Caprella robusta Stimpson, 1854 (1853), p. 44.—Mayer, 1882, p. 66; 1890, p. 73.

Caprella punctata [not Risso] Boeck, 1861, pp. 676–677; 1871a, p. 277 (197); 1873–76, pp. 698–699, pl. 32, fig. 11.—Norman, 1886, p. 26; 1905a, p. 26.—G. Sars, 1886, pp. 69, 89; 1895, pp. 660–661, 700–701, pl. 237, fig. 2, pl. 8, fig. 3.—Brüggen, 1907, p. 238.—Nordgaard, 1911 (1912), p. 24.—Stephensen, 1928, p. 385, fig. 92 (8); 1933, pp. 60, 77; 1940, p. 74; 1942, pp. 442–443, 504, 505; 1944a, p. 50; 1944b, p. 159.

Caprella Septentrionalis.—Herklots, 1861, p. 43.

Caprella Stimpsoni Bate, 1862, p. 361.—Whiteaves, 1901, p. 220.

[?] *Caprella hystrix* [not Krøyer].—Bate and Westwood, 1868, pp. 63–64.—M'Intosch, 1874, p. 272.—Koehler, 1884 (1885), pp. 112, 117; 1885, pp. 54, 61.—Bate, 1887, p. 175.—Bonnier, 1887, p. 354.—Robertson, 1886–87 (1888), p. 72.—Walker, 1895b, p. 475.—Norman, 1905b, p. 85.—Norman and Scott, 1906, p. 99.

Caprella longicornis Boeck, 1871a, pp. 274 (194)–275 (195); 1873–76, pp. 691–693, pl. 32, fig. 7.

Caprella Lovéni Boeck, 1871a, p. 276 (196); 1873–76, pp. 694–696, pl. 32, fig. 8.—Meinert, 1877–78, p. 171.—G. Sars, 1895, pp. 662–663, pl. 238, fig. 2.—Stephensen, 1928, pp. 385–386, fig. 92 (10).

[?] *Caprella hystryx*.—Bate, 1878, p. 509.

Caprella septentrionalis f. *typica* Mayer, 1890, p. 66.

Caprella septentrionalis f. *longicornis* Mayer, 1890, p. 66, pl. 2, figs. 26–27, 33, pl. 4, fig. 31.

Caprella septentrionalis f. *nodigera* Mayer, 1890, p. 66.

Caprella septentrionalis f. *polyceros* Mayer, 1890, p. 66, pl. 2, fig. 32.

Caprella septentrionalis f. *parva* Mayer, 1890, p. 66, pl. 2, figs. 28–31.

Caprella monoecera G. Sars, 1895, pp. 661–662, pl. 238, fig. 1.—Ohlin, 1895a, pp. viii, xiii, xvii, xix, 64–65.—Nordgaard, 1905, p. 185.—Stephensen, 1928, p. 385, fig. 92 (9); 1933, pp. 60, 77; 1940, p. 74; 1942, pp. 442, 504, 505; 1944b, p. 159.

Caprella septentrionalis f. *spinigera*.—Hansen, 1895, p. 130.

Caprella stimpsoni.—Holmes, 1904 (1905), p. 527.

Caprella septentrionalis longicornis.—M. Rathbun, 1905, pp. 7, 78–79.

Caprella septentrionalis stimpsoni.—M. Rathbun, 1905, p. 7, 79.

Caprella septentrionalis polyceros.—M. Rathbun, 1905, p. 7, 79.

Caprella septentrionalis lovéni.—Stephensen, 1929a, p. 180, fig. 334.

Caprella septentrionalis monoecera.—Stephensen, 1929a, p. 180, fig. 334.

Caprella septentrionalis punctata.—Stephensen, 1929a, p. 180, fig. 334.

Caprella septentrionalis f. *monoecera*.—Oldevig, 1933, p. 266, fig. 2 (p. 267).

Caprella septentrionalis f. *punctata*.—Oldevig, 1933, p. 266, fig. 3 (p. 268).

Caprella septentrionalis f. *lovéni*.—Oldevig, 1933, p. 266, fig. 2 (p. 268).

Caprella lovéni.—Stephensen, 1940, p. 74; 1942, pp. 441, 504, 505; 1944b, p. 159.

Diagnosis.—Body usually with numerous spines and tubercles, peduncle of antenna 1 rarely with setules, ratio of total length to

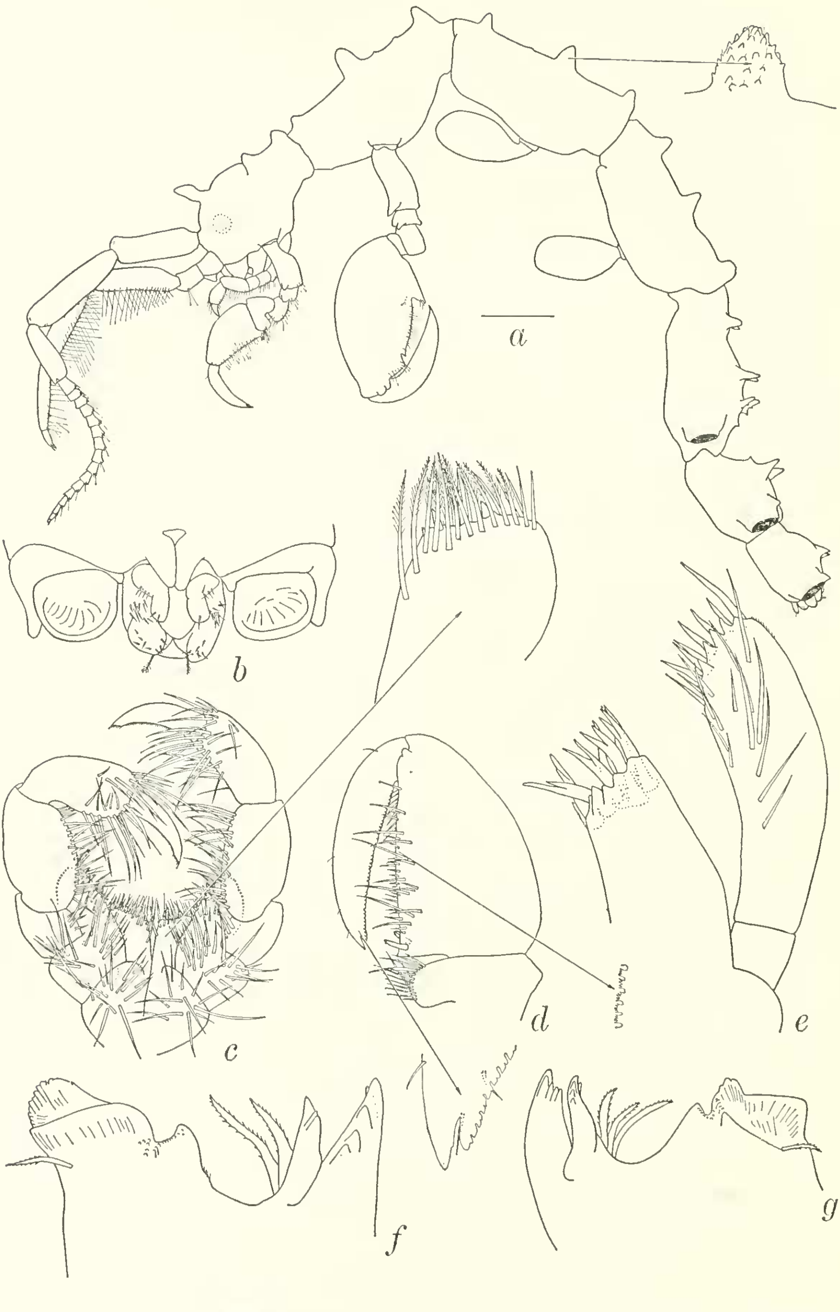

FIGURE 19.—*Caprella septentrionalis*, male; *a*, lateral view; *b*, abdomen; *c*, maxilliped; *d*, gnathopod 1; *e*, maxilla 1; *f*, right mandible; *g*, left mandible.

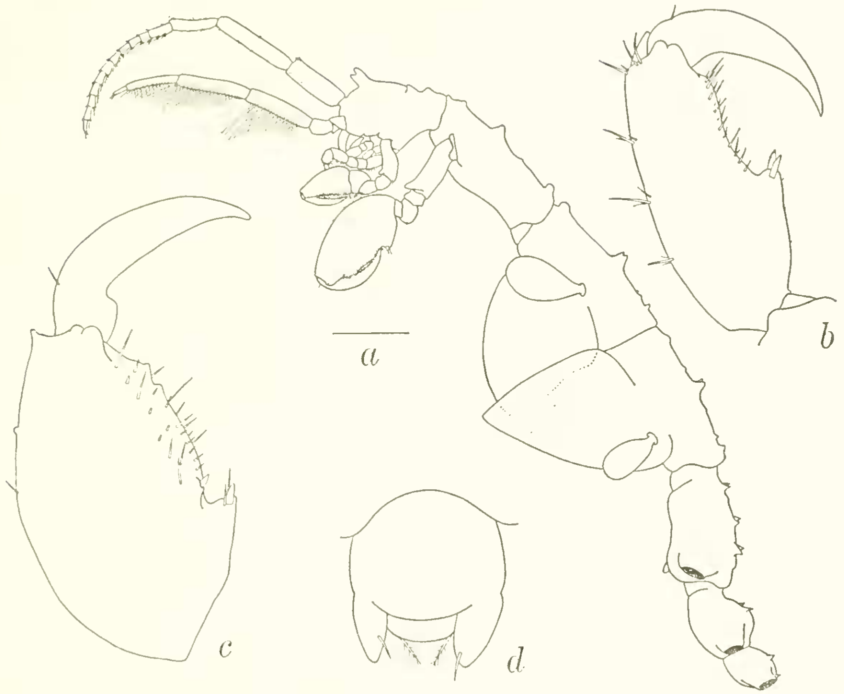

FIGURE 20.—*Caprella septentrionalis*, female; *a*, lateral view; *b*, pereopod 7; *c*, gnathopod 2; *d*, abdomen.

length of basis of gnathopod 2 usually greater than 13.0, inner surface of gnathopod 2 with small tooth adjacent to poison tooth.

DESCRIPTION.—Body spination variable. Length of largest male 20 mm, largest female 20 mm, smallest ovigerous female 9 mm.

Peduncle of antenna 1 occasionally with dense setules. Length of antenna 2 longer or shorter than peduncle of antenna 1.

Mouthparts typical of genus, right lacinia mobilis 5-toothed.

Propodus of gnathopod 1 with 2 proximal grasping spines, grasping margin of dactylus and propodus serrate. Palm of propodus of gnathopod 2 with proximal poison tooth and small tooth on inner surface, distally with small tooth, notch, and rectangular projection, anterodistal margin occasionally with projection; basis short and robust.

Gills usually elliptical, occasionally oval and inflated.

Propodus of pereopods 5–7 with pair of proximal grasping spines.

Abdomen of male and female typical of genus.

VARIATION.—Body spination varies from quite spinose to almost as smooth as in *C. linearis*. Usually the cephalon is furnished with at least a single spine.